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ABSTRACT

As a result of a Technology Retreat sponsored by the Maricopa Community Colleges (Arizona) in 1988, action/research groups were formed to explore the various challenges of implementing instructional technology effectively. This interim report reviews the work of the groups, with a summary report from each, as follows: (1) "Alternative Funding Sources for Technology Applications" (Angela Ambrosia and Dan Whitemore); (2) "Classroom of the Future" (Chuck West and Mike Svaco); (3) "Cross College Collaboration" (Doyle Burke and Bertha Landrum); (4) "Improving Access to Learning with Technology" (David Dalby and Naomi O. Story); (5) "Library/Learning Resource Center of the Future" (Carmen Coracides and Laurita Moore); (6) "Planning for Information Technologies Facilities" (Jim Jacob and Jan Baltzer); (7) "Staying Current with Technological Change: Implications for Internal Training and Development" (Jamie Cavalier); (8) "Technology, Learning Theory, and Curriculum Restructuring (Integration of Learning Theory, Content, and Technology)" (Julie Bertch and Billie Hughes); and (9) "Where Are We Going and How Do We Get There" (Mark Montanus and Ron Bleed). Selected comments from the discussion leaders (Chairs) are included. (SLD)

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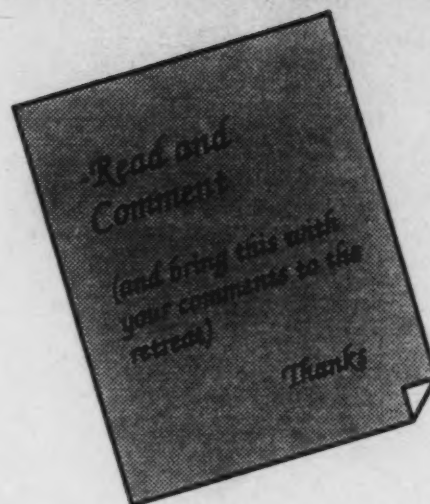
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Interim Report

1988-89



OCOTILLO

improving Learning Through Instruction

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Preface

This interim report of Ocotillo is the direct result of a succession of events beginning in the 1987-88 academic year. During that year, Alfredo G. de los Santos Jr. approached several groups within the Maricopa District asking a series of questions about the future uses of technology in the instructional setting. One of the groups that he approached was the District Academic Computer Users Group (DACUG). DACUG discussed these questions and came to the opinion that a larger group needed to be involved in this discussion. In November of 1987, representatives of DACUG approached Alfredo about holding a retreat to discuss the future of instruction especially in light of the newer technologies.

In May 1988, DACUG sponsored Technology Retreat '88. Participants at the retreat included faculty from many disciplines, Deans of Instruction, College Presidents, Vice Chancellors and Governing Board members. Retreat participants identified eight major issues. So much excitement was generated around these eight issues that commitments were made to extend discussions into the 88-89 school year by involving more people.

Following the retreat, Alfredo appointed us to chair the follow-up process. We spent the summer planning what is now known as Ocotillo. Eight "Action/Research Groups" were established and faculty leadership and administrative support persons were selected for each group. A ninth Ocotillo group was begun in January to address the training issues surrounding keeping current with technology.

Over 100 faculty and staff attended the beginning of Ocotillo, held August 26 at the Phoenix College Bears Den. Paul Elsner, Chancellor, opened the meeting. He endorsed the Ocotillo effort by re-asserting the importance of the technology agenda in community college education. Elsner challenged attendees to plan boldly and creatively.

Since this beginning, the groups of Ocotillo have worked to address the issues identified at the retreat. They studied the issues, made recommendations and formulated the questions that need to be addressed in the future. The group reports which follow reflect the thoughtfulness of the participants as well as the guidance of the group leaders during the year. A lot of people have contributed to Ocotillo during this past year. We know that over 200 faculty and administrators have attended meetings of an Ocotillo group.

We want to thank everyone who has contributed to the work of Ocotillo this year. It is this cooperative spirit and creative genius that makes Maricopa great. A special thanks is extended to the faculty who chaired Ocotillo groups in addition to their teaching responsibilities and other duties, and to the administrators who supported each group. We also want to thank Lauretta Peters who has provided support to Ocotillo through the year and who has done an excellent job in formatting and assembling this report.

Alan Jacobs
Jim Walters

Report by the Ocotillo Action/Research Group

Alternative Funding Sources for Technology Applications

by Angela Ambrosia, Chair - PC
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Group Participants

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Bob Christen, GCC
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Stan Grossman, GWC

Alternative Funding for Technology Applications

The Problem

In answer to its function as a community leader and resource, MCCCCD has focused technology as a major emphasis - both for the present and the future. In the past, while the district has successfully received major dollars for new capital, there are still needs that have not been adequately addressed. Furthermore, the community colleges are facing the twin specters of increasing costs with relatively stable revenue. Therefore, there is a continuing need to acquire new alternative financing sources so that the community college is able to fulfill its functions as a service to the community. New funding would help the district to resolve problems in two areas:

- Funding present operating costs; and
- Funding anticipated new technologies

Such funding will support both research development and the instruction of this technology in the community.

An Overview: Resource Development

Present sources for resource development:

- Foundation/Alumni
- Fundraising Campaign
 - Community Donations
 - College Endowment
- Earnings
 - Corporate Contracts
 - Community Service (non-credit)
- Government Relations
 - Legislative
 - State
- Bond Issues
- Student Tuition and Fees
- Grants and Awards
 - Federal
 - State
 - Private Foundations

Comments

Opportunities Identified

After active exploration the alternative funding group consolidated and categorized resource development into major areas that warranted further attention and efforts. These included:

- Cooperative efforts with third parties
- Grant resource development
- Efficient use of existing resources
- Bond referendum

Cooperative efforts i.e. arrangement with government, industry and education institutions results in the development and implementation of training/educational programs in the business community.

Grant Resource Development is an area pregnant with funding possibilities. However, in order to increase its competitive edge, the district needs to develop a team concept. Such an approach would be the answer to the fragmented approach presently in operation thus enhancing its ability to contract and the writing of winning proposals.

The Efficient Use of Existing Resources is a self-fulfilling prophecy. An information system that matches needs of the business community with resources within the educational community will create the credibility that is required thus attracting further participation and utilization of such a program. A clearing house concept will facilitate the sharing of resources - not only of personnel and facilities, but also of technologies.

A Bond Referendum will enable MCCD to be proactive in a new era of technology - technology which will require a need for additional funding.

The Plan: A More In-Depth Look at Each Opportunity

Cooperative Efforts

By pooling their resources, government, industry and education are able to develop and provide both required and desired training and education in the business community. Such synergy is a source of revenue for the district - either in actual dollars or in cost reductions. For example, after forming a partnership with a local corporation, the college district can either provide the facilities for corporate training and/or the educational programs for said training. These efforts help industry to fulfill its long term need for developing a labor pool of technologically competent personnel, while paying the district for the delivery of such programs. Also, because various foundations provide funding for some educational programs, as a provider of such programs, the district could be the financial recipient of some grant monies.

It is the Maricopa Community College District's philosophy to initiate such exchanges with enterprise - thus developing partnerships. In order to initiate such exchanges, the district looks for one or more of the following criteria:

- Both sides must bring something to the partnership (i.e. either a saving of dollars or an infusion of donations and grants)
- Technology support is available from both parties. This support is realized through the close relationships between software engineering, technical support and willingness to answer questions relating to the technology and its applications. The private sector often answers the first two while the district answers the last need.
- The corporate world's knowledge of future products and pre-releases helps the district make decisions relating to future planning.
- MCCD has gained credibility and visibility in both national and inter-national settings. Such recognition, achieved through both word of mouth and printed material, is a form of good will that can benefit third parties who associate with the district.

An Action Plan

In order to generate and maintain such cooperative efforts the Alternative Funding Group is recommending that MCCD be willing to do the following:

- Make a commitment to spend dollars to make expenditures on behalf of different corporations.
- Work on public relations - presenting with honesty the positive aspects in store for third parties who associate with the district.
- Articulate the skills and expertise that the Maricopa Community College District brings to the relationship - skills in programming, technical support and in-kind support. This latter includes training each other's people in different areas.
- Develop the patience and flexibility required to work with new technology. In dealing with new products, it is important to leave a margin for error. This is because new products don't always work and new equipment may not always be successful.

While this last step is more attitude than action, it encourages the necessary supportive environment that is needed while the district is involved in making new risk-taking technological advances.

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Grant Resources

Various Maricopa Community College District personnel work in an effort to obtain grant funds for various programs. The Alternative Funding Group found that the efforts, however, are not coordinated and are extremely fragmented.

District Office personnel currently monitor RFP availability and alert college executives and deans to the possibilities. Within a short time frame, any staff member may then attempt to write a proposal. Units that are recipients of such funding must deliver the services according to the terms of the grant.

The Alternative Funding Group recommends that the colleges develop a team concept to address grant resources. The approach to successful grant development is:

- Know MCCCDD's goals and objectives. There is no value in soliciting funds that are inconsistent with these goals.
- Know MCCCDD's capabilities. Upon the acceptance of an award, the district is legally obligated to perform according to the terms.
- Know the resources available. Monitor the various sources and learn the strings attached before applying for funds.
- Cultivate potential sources of external funds. Different sources have different requirements. Since time is essential, one should know the idiosyncrasies and do developmental work prior to the issuance of the RFP.
- Monitor grant and contract RFPs. Timelines are short and immediate reaction is necessary.
- Develop winning proposals. This is an art in itself.
- Perform as promised. Reputations become established and it becomes increasingly easy for an experienced person who delivers as promised, to secure grants and contracts.

An Action-Plan proposal writing is episodic as RFPs are issued. In addition, the RFPs from different agencies are very different and require different skills and expertise in order to respond effectively. Therefore, it is recommended that MCCCDD budget \$5,000.00 to be allocated to the college presidents on an as-needed basis.

The money could be used to hire skilled consultants to write proposals on a fee for service basis. The consultant selected would have the skills required for the particular RFP, thus increasing the likelihood of success. In addition, the consultants would be working with college personnel that are responsible for the control and maintenance of the project.

Should we develop some kind of quality control to develop the perform-as-promised history?

(R)

Efficient Use of Existing Resources

The success of any partnership venture that the district undertakes depends heavily on providing services in the most efficient way possible.

This efficiency will both enhance and create the requisite credibility needed to attract the further participation of industry.

Efficiency could be greatly improved through a pooling of information about resources within the educational setting - information inclusive of, but, not limited to MCCD; it would also include various school districts, other colleges and allied agencies. Such an information system would identify resources such as personnel with specialized expertise, facilities and technologies. This clearing house concept could facilitate inventory taking and the sharing of such resources. In short, this could be the key to matching needs with services. Such an information base, developed and provided through a library system, would present to the business community a unified effort on the part of the educational community - an effort that matches the consolidated efforts of this latter business community.

Other benefits of a clearing house system include its ability to identify the availability of single application software (i.e. software that is critical for use during a learning experience but would otherwise gather dust until needed again); and its ability to generate information about unused, available computer time. This latter function of the system is a highly profitable revenue generator - leasing computer time to the local business community. It is a win/win for both environments: 1) Businesses acquire short term resources at fair, often below market price; and 2) The revenues generated by the district could offset expenses incurred in the marketing of technology instruction to the community.

Users of such a clearing house have also been identified. Various types of users include the emerging of stable industries either currently located, relocating or just starting in the Phoenix area. The primary focus of the business joint ventures should be initially developed by the telecommunications industry - companies such as NEC Communications Systems and AT & T. These industries could be major partners in joint ventures with MCCD. Smaller companies could be encouraged to combine their resources so that they too can use the community as a contact or as a technological support system. One way these smaller companies could offset cash flow problems and still be able to afford such technological support is by encouraging them to pay for such services through contributions of donated equipment and personnel resources. Their contributions would be added to the clearing houses data bank.

The recommendation of a database of resources is mentioned by several groups in different contexts. We still know too little about what each other is doing!

An Action Plan

The procedure for establishing a clearing house of resource information would begin with obtaining an "inventory" of resources from the educational/institutional partners. This inventory would include information about the normal technological equipment, as well as personnel expertise available at each location. This latter aspect of the process would uncover which employees in the district are available for instructional purposes and which ones can perform highly specialized tasks. A similar, albeit complementary inventory process would be required from the business community. This would enable the clearing house to match needs with resources. The major investment for this program would be in the library services needed to catalogue the resources and to schedule said resources for use. A complication already identified is the need to determine the actual time the resource has already been scheduled for use by the home agency and its availability for use by others. Many forms of communication could be used to share such information, and a brief study should be undertaken to identify the most cost effective approach that could be taken under the circumstances.

Bond Referendum

The committee suggests that a \$40 million dollar request be added to the next general bond referendum. The reason for this is that the most significant financing source for funding technology is the new general obligation (G.O.) bond issue. The \$40 million should be added to the list of new buildings, remodeled buildings, and additional equipment in a the next bond referendum. This will be earmarked for technology equipment.

This is an increase of \$10 million for technology over the 1984 bond referendum. We anticipate a new era of technology which will need a new funding source. While specific technology projects are not yet identified, the committee recommends \$40 million for the following reasons:

- It will be ten years since the last capital funding source was put into place and that funding source from G.O. bonds will have been completed at the time of the next referendum.
- There are new technologies on the market, such as video-teleconferencing, which will require additional capital dollars.
- Computers beget computers. As faculty, staff and students use the computers, there is a growing need for more capacity and new uses.
- The new technology will insure Maricopa remains on the cutting edge in the delivery of the best possible educational product.

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Wouldn't this cost half-a-million per campus? Let's add another \$5 million just for this.

And computers become outdated.

Comments

Once a general obligation bond referendum is approved by the voters, the rest of the funding mechanism is quite automatic. Approvals from the Governing Board and State Board will be secured and the District's bond fiscal agent and bond attorneys will handle the recommended procedure to finalize the bond sales. The funds to pay the bonds come from property tax through a "secondary tax rate."

Action Plan The committee recommends the District move forward with including \$40 million for the next general obligation bond referendum to finance most of the new technology requirements for the next ten year capital development cycle.



What about the operational funds to use all the things purchased with capital dollars?

Classroom of the Future

by Chuck West, Chair - GCC
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Classroom of the Future

Introduction

The involvement of computers in the academic community is a natural and desirable evolution brought about by the growth of technology and the adaptability of that technology into the preparation and delivery of instructional material. As computers continue to play a larger and larger role in the curricula, it is imperative that the administration become involved in the development of a campus wide computer plan that will give direction, support and consistency as each project unfolds.

Many students arriving at the community college come prepared and with expectations to use computers after having used them in the home and also in High School programs. Community Colleges must be prepared to fulfill this need and meet the expectations of their student population. Not only is it necessary that students have knowledge of computers and how to apply them in solving particular problems, but it is also necessary that faculty use computers to increase classroom productivity. Just as audio-visual equipment, blackboards and chalk, and other classroom materials were necessary in the past, computers will be as valuable and necessary in the classroom of the future.

The Problem

The classrooms that we now have are not constructed to accommodate differing learning and teaching styles that use technology. The construction of the building determines how the curriculum will be delivered.

Most faculty are not aware of the types of technology that is now available for classroom instruction.

Future faculty will be required to teach in different ways in order to take advantage of that aspect of technology that will increase the communication between teacher and student.

Most colleges are not prepared to instruct new and current faculty in the process of integrating technology with curriculum.

Most colleges are not equipped to develop new courses that require technology related delivery systems.

Technology that does exist at the colleges is fragmented. The individual departments develop separately. The rate of development depends upon the expertise of the Department Chairs and the individual department members.

Comments

This thought is also expressed by other groups.

The resources that are available in the library have not been integrated into the technology assisted instructional programs that are developing in the departments .

The external sources of information that are available has not been utilized by the colleges. (data bases, other libraries)

Classroom of the Future

The classroom of the future will be one part of a multifaceted, technology intensive, instructional program which will bring together a new and innovative approach to the methods of delivering information to those members of our community who would like to obtain knowledge.

The classroom will be designed to meet the needs of the learner rather than accommodating the conventional methods of instruction used by most faculty. In this room the instructional program will determine how the room is utilized, rather than the room construction determining how a curriculum is delivered. The room will have the ability to meet the needs of different types of learning methods. The prime objective is maximum flexibility. In order to accommodate the different teaching styles requested by faculty, the room should have the infrastructure necessary to arrange the work-stations in any order requested. The teacher should be able to teach from any place in the room (front, back or side). Power and data lines should be available in the floor and walls to facilitate any possible teaching environment.

For example:

- **Chairs** should be adjustable in height and swivel.
- **Tables** should have a drawer to house the computer keyboard and the computer monitor should be adjustable in height.
- **The monitor** should be placed down in the table when not in use. There should be room for note taking during lectures.
- **The CPU** should be under the work table . There should be storage space for the students books.
- **Monitor projectors** should be able to project onto a large screen for student viewing. The monitors may be front or rear projection. The projectors can project an image that is as large as a normal chalk board.
- **A link system** should be used to enable the instructor to observe any students monitor and/or project his monitor on to the students monitor. The link system does not alter the program the student is utilizing, it only effects what is projected on the monitor.

Is it a room? with one teacher?

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Ⓜ *How many configurations are needed? How many classrooms will need one computer per student?*

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Comments

- **A writing tablet** should be used rather than a conventional chalkboard. It should project onto the large screen and/or the students monitor. This works very much like an overhead projector, except it can be transmitted to the students monitors.
- **A video camera** should be used to project solid objects upon a large screen or the students monitors. The camera should be permanently mounted in the room. The University of Texas had the camera in the ceiling. The University of Arizona had the camera on a special table in the front of the room. The camera can be focused to project written material or solid objects for students viewing.
- **16 mm film and/or 35 mm slide projectors** should be able to project upon a large screen and/or the students monitors.
- **A multi-lighting system** should be provided to vary the illumination. Different types of presentations will require different degrees of illumination. In many cases, different parts of the room will need lights while other sections will need reduced lights.
- **Networked workstations** should be utilized to reduce the cost and problems encountered with utilizing floppy disks. The problems encountered due to the lack of standardization of printers and printer drivers could be greatly reduced since networking would place every computer on the same system. Networking would prevent the students from altering the programs and/or the operating system.
- **Library networking** should be provided to bring the vast amount of resources available into the classroom. Through the library we can connect to other libraries in the College District as well as ASU.
- **Modem connections** should be provided for the ability to connect with the vast amount of information that is free from the data bases provided to the public by the government and other sources. This is a very rich untapped source of information that could be used in our instructional programs.
- **Voice, video and data transmission** to classrooms in other buildings and/or other Colleges should be encouraged, in as much as, we will have that ability.
- **A portable master control** should be provided to allow the instructor to control the room from any point.

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How do we take these ideas further? Should we build a pilot classroom somewhere?

Instructional Support

The second part of this instructional program involves an Instructional Innovation and Software Support Center. New, as well as many of our current, faculty do not have the knowledge needed to take advantage of new, as well as, present technology. This Center will supply instruction in the use of software (electronic mail, word-processors, grade-book programs.) Each new faculty, as well as, continuing faculty will need to receive training in the use new software and hardware as it becomes available for the integration into their curriculum.

The Center will maintain an inventory of all software purchased. This inventory should be maintained on the VAX system to enable faculty and administrators to have access to software listings from their offices. The Center will help in selection, purchase, cataloging of software. Assistance should be provided in the development of new methods of instruction. Software will have to be evaluated and course-ware written for their particular curriculum. Authoring programs will need to be utilized for those curriculums that do not have software available. (The teacher of the future will have different skills and will teach in different ways). This center will need to have the hardware and software to support the development of these new programs.

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Should we develop an on-line software listing now?

Teacher of the Future

In years past, the teacher was viewed as the font of all knowledge. From Socrates to the present day, the teacher spoke and the student listened. Discussions were fostered, but led. Debate encouraged, but controlled.

The *Socratic method* dominated education until about 1450. At this time, Johann Gutenberg produced the first change in the teaching/learning process due to technology. The production of mass produced books altered the process by which learning occurred. Printed material has become indispensable to the teaching/learning process in the educational environment. After a course is created, a text and resource materials are selected, so that the student has not just one "font of knowledge," but several sources. The textbook has freed the teacher to delve more broadly into conflicting or other opinions and an expanded fact-base. The role of the teacher, before a group of students, was to deliver content (supplemented/complemented) by the text, to guide the learning, to emphasize the "most important" of all the content information arrayed, to focus on the skill (be that of critical thinking or science lab technique), and to assess the student learning by whatever methods seemed most appropriate.

Some teachers have expanded the array of information presented to their learners by taking advantage of "newer" technologies. Films and video tapes complement or expand the information presented and in some cases these media are by far the best or simplest way to expose the student to a culture or to take them to Mars. The newer technologies enrich the teaching, expand the teaching, foster the learning, in ways that could not have been imagined in the days of Socrates.

A shift has and is occurring in our learning environments. We acknowledge, more comfortable today than yesterday, that the teacher is not and cannot be the "font of knowledge" because knowledge is expanding at an exponential rate. At best, our role as teachers is to expose our students to the basics of our discipline, to guide the learning process with the tools we have at hand, and to assess that learning in conjunction with the very tools we may use to teach.

The teacher of tomorrow embraces the role of guide, the role of partner in learning, the role of teaching critical thinking skills as well as content, the role of teaching students how to learn and to love learning, the role of mentor and example of a dedication to growth in a rapidly changing world.

The teacher of tomorrow will also teach the technology tools for learning as well as the basic critical thinking skills. They will demonstrate that all tools have a place in our learning community. The "tool" may be a computer or a video monitor or any other technological advancement. The *teacher of the future* will recognize the value of such tools, continuously explore the uses of those tools to expand the learning, to enrich the learning, and to place more of the responsibility for learning in the hands of the learner. We, as teachers, will become the guide to knowledge possibilities. We structure learning. Where the tool can assess the learning more objectively than we can as humans, we incorporate the objective strategy. Where the tool can allow a student to progress at his or her own rate, we design material/programming/sequencing so the learner is self-paced. We recognize that the technology frees us to work independently with a learner (...back to Socrates ?) because the routine, the basics, can be delivered by technology and we then have the time to work with learners one-on-one.

The College District should seek teachers who are *open* to the use of tools, willing to *experiment* with the tools, to *explore*, to *risk* so that all available tools can be *orchestrated* for the learner. The master conductor ...**THE MAESTRO**..... maybe that is the definition of the Teacher of the Future.

Sounds similar to the Technology, Learning theory & Restructuring Curriculum report.

How will the "best" teaching of the future differ from the "best" teaching now?



Cross College Collaboration

by Doyle Burke, Chair - MCC
Bertha Landrum, Coordinator - District

Group Participants

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Kathie May, District

Donna Murchland, District
Joan Owens, MCC
Ken Roberts, PVCCC

Joe Lecluyse, PVCCC
Jean Staten, GCC
Jean Abel, GCC

Cross College Collaboration.

At the first meeting of Cross College Collaboration, the committee discussed our focus and agreed that our concerns included both instruction and administration. Second, we agreed that collaboration was possible among colleges and that we should proceed with that expectation.

The group discussed specific activities to generate cross college collaboration. For example, we identified sophomore-level courses that were cancelled at several colleges because of low enrollment. Technology, we assumed, would allow colleges to serve those students. Second, we talked of the possibility of interactive registration among colleges. And finally, we discussed the collaboration of faculty to develop courses utilizing technology that could be shared among colleges. Our purpose was to demonstrate collaboration in action.

During the year, Jean Staten, Jean Abel, Ken Roberts, and Mary Briden worked to identify sophomore-level courses at Glendale, Paradise Valley, and Phoenix College that did not make because of low enrollment. Subsequently, they coordinated their fall 1989 schedules to list common courses at the same hours. Their plan is to advertise sections at other colleges if any one of the colleges has to cancel a section. Eventually, we hope that a course at one college may be televised to sites at other colleges and that students may sit in the course on the home campus. With this activity, we are addressing both cross college collaboration and the use of technology.

A second effort involved interactive registration. We learned that the technology is available to allow a person at one college to access the data base of another college and enroll a student in a section. However, we recognized that such action involved careful discussions among registrars, administrators, and department chairs. Joe LeCluyse, a member of our committee, met with registrars to begin work on that activity.

The registrars agreed that the concept was feasible, but that it would need to be implemented in phases. The premise is that such cross-college registration would be considered for students who were unable to enroll in a course or courses at the home college because of unavailability of sections at times the student needs. The registrars want to discourage a student from attempting to register for all classes at another site, where there might be shorter lines, for example. Further, they discussed the impact of users on each college's system, the identification of screens, the process of applications, the consistency of policies

Comments

(R)

(R)

Comments

among colleges, and the procedures colleges follow.

They agreed to a four-phase program to implement the process. It should be noted that the committee sent a letter to college presidents alerting them of the committee's request before registrars began working in earnest on the program.

Finally, we discussed faculty members collaborating to develop courses using technology. One possibility was the development of HUM 205 as a television course, but faculty schedules prohibited their agreeing on a plan. Several faculty members were interested in the project, but each had reservations about the time commitment to develop a television course. Each knows enough about television and film to anticipate the demands of research, script writing, production, rehearsal, document preparation, etc. Even with reassigned time each would have to give up present responsibilities to create the course.

A second plan was a recommendation to develop a one-hour course in grammar for business writers. The idea is to offer the course on computer with access by modem. If the course is developed, it could be advertised to businesses in the community. A one-hour course involving written material could be done more economically than a three-hour course on television. It should be noted that the last area is still in the discussion stage. Definite plans have not been made to implement this activity.

The committee heard reports from Helen Sprawls of Rio Salado community College, from Jan Baltzer of Information Technology Services, and from Dr. Chuck West of Glendale Community College. Each spoke about available technologies which colleges could share and about instructional methods utilizing technology.

It would be helpful to have more information about this program.

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I like the idea of a pilot project.

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Improving Access to Learning with Technology

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Improving Access to Learning with Technology

Perspective

In the Maricopa County Community Colleges the doors are open to all who wish to pursue new knowledge and skills. There is no "floor" or "ceiling" to limit the types of learners. The colleges have consistently pursued the philosophy of open access to their facilities, programs, resources, and services to facilitate the successful achievement of educational goals by all participants. However, there are many important questions about the validity, consistency, kind, and equity of access that does and should exist in the Maricopa Community College District. The major charge of the Ocotillo Improving Access to Learning with Technology Committee was to define any issues and concerns that imply or impact access to learning. Access to learning and success is a concern for the Maricopa Community Colleges, other Arizona educational institutions, and local to national leaders in education, business, industry, and government.

Access to learning is a general concept and involves:

- Anything that impedes or prevents the successful attainment of goals by students or faculty.
- Anything that is lacking which prevents identifying, recruiting, and serving new types of student populations.
- Anything that can improve the kind, degree, and effectiveness of delivery of educational programs and services.
- Any technology, procedures, social issues, legal statutes, economic factors, instruction, administrative processes, physical facilities, equipment, or services.

The Maricopa Community Colleges will have met the challenge of access to learning when they visibly provide maximal equity of access to all persons who need and desire it and can demonstrate success in doing so.

The Chair has gone directly to each of the colleges and centers for direct input from individual faculty, staff, administrators, and students. The Appendix is a compilation of the data that was obtained from many hours of interviews, discussions and communications utilizing the electronic mail system.

Comments

• The Appendix printed in this document represents about one-fourth of the comments submitted by Dave Dalby. It is filled with meaty comments and suggestions.

Questions

General questions about access to learning that were addressed were:

- Who has access?
- When, where, and how is access provided?
- Who establishes access priorities?
- Who designs, implements and evaluates programs that address access ...priorities?
- How can communication and relationships be facilitated among ...departments and services throughout the MCCD?
- Does or should equitable access exist everywhere in the MCCD?

Contributors of issues and suggestions regarding access to learning in the Maricopa Community Colleges implicated:

- Technology equipment and use policies
- Interdepartmental and intercampus communication
- Administrative, faculty and staff attitudes and behaviors
- Campus image, marketing, public relations, adoption of innovations, politics, parking, security, strategic planning and implementation
- Motivation, attendance, retention, and success of under-prepared and at risk students
- Faculty staffing, hiring, work loads, and achievement recognition
- Recruitment, orientation, assessment, advisement, registration, tracking, intervention, and financial aid for all students
- Evaluation of programs, innovations, policies, instruction, etc.
- Physical facilities, budgeting, academic calendar, fiscal policies and reporting, general education requirements
- Technology equipment on-campus and off-campus, training and utilization
- Professional development of faculty and staff on orientation, advisement and instruction
- Networks of computers, MCCD campuses, universities, libraries, business, industry, government, faculty, staff and students
- Distance learning, recruitment and alternate delivery of instruction
- Software development, banks, evaluation, versatility, communication, training and utilization
- Minority, special, and new student populations

Recommendations

The results of the past year's activities have clearly demonstrated that there are numerous factors that are restricting access to learning throughout the Maricopa Community College District. Some issues and suggestions are unique to an individual campus, but the majority of concerns that have been identified impact all the Maricopa Community Colleges and the District Office. In addition, many excellent innovative programs, policies, proposals, plans, and projects pertaining to the access question have been implemented at different campus locations, and these should be considered for wider adoption at the present time. Some goals to be considered by the Access Committee for the coming year should be to:

- Continue identifying additional access concerns and solutions.
- Examine current results and identify the most critical and pervasive concerns.
- Validate the extent of the most critical issues and evaluate the success of current approaches to their solution.
- Promote implementation of valid successful programs.
- Establish time lines and persons responsible for accomplishing goals.

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Appendix

Problems Identified at Phoenix College

- Lack of access to computers for mathematic and English classes during scheduled class times and during open times by individual students
- Assessment scores are not easily available for all classes
- Lack of using placement scores in reading, English, or mathematics for advising/allowing students into courses which require college level knowledge and skills in these areas
- Inappropriate stereotypes of faculty that they are not willing to do distant recruiting, orientation, testing, etc.
- Students sometimes do not have access to text books because of lack of money
- Students at risk of failing are not identified soon enough
- Longitudinal research concerning attrition, student failures, "W" grade policy, higher tuition costs has not been done or made available to departments
- Poor advising of underprepared minority students into inappropriate and too difficult courses
- Lack of Indian recruitment, orientation, assessment and registration at distant out of town sites
- Inadequate numbers of tutors to cover all disciplines in the Learning Center
- Computer literacy and computer usage is not available equitably to all disciplines and classes
- Inadequate program for getting some faculty to rethink and change their attitude toward the type of students we now have to serve and realize that "flunking them" is not productive for anyone
- Advertising, staffing, and student use of Learning Center services are not optimized
- Phoenix College is not adequately or effectively advertised such that it is highly visible and utilized by the Valley community
- Financial Aid Office has students fill out same forms two or more times; loses information; has students fill out wrong forms; loses records showing that forms were completed and filed which results in students being told they have never applied; poor organization instructions, filing, and knowledge by workers in the office; always assuming and telling students that the students are wrong or did not fill out and turn in forms; negative attitudes reflected in the treatment of students
- Absence of any tracking of students who take developmental reading, English, and mathematics courses to evaluate if these courses actually lead to success in subsequent courses and in completing 2-4 years of college
- Inadequate continuing professional development of faculty regarding textbook selection, course design and planning, student characteristics, skill analysis, writing for learning, TAC, grading, test construction, advising, interpersonal relationships with students, etc.

Solutions suggested at Phoenix College

- More peripheral computer labs for specific discipline applications, faculty programming, and student use as per demand
- Big screen projectors in classrooms for instruction on how to use computers, software, or presentation of course content, notes, outlines, problems, tests, slides, demonstrations etc.
- Implementation of campus or district wide networks so that many different kinds of computers and terminals can use the same software to avoid having to create the same software application in many different languages
- Creation, implementation, and continual evaluation and modification of new recruitment programs for Black, Hispanic, Indian and other minority students
- Create orientation classes or workshops that effectively teach students how to research, read, understand and plan their future using college catalogs
- Communicate new effective models to faculty and students that clearly relate attendance requirements to grades and success in college
- Design and implement a positive training program for employees and student workers in Financial Aids and Admission and Records
- Hire more minority employees so that students can readily see that Phoenix College is a place for minority faculty, staff, and students
- Conduct a longitudinal research program to evaluate how time, tuition costs, and the "W" grade change policy have related to student retention and success
- Provide useful student tracking information research results tailored to requests of specific departments for program evaluation and design
- Communicate to all faculty and staff that an emergency short-term student loan process for up to \$100 presently exists to help needy students purchase school supplies
- Establish an innovative intervention program to identify, evaluate, and help at risk students early in the semester

- Create a humane program that monitors and actively helps Indian students from distant sites locate in Phoenix and actually get started at Phoenix College, especially timely receipt of financial aid money
- Increase the number of tutors, special equipment, services, and appropriate budget for the Learning Center so that it can serve more at risk students and enhance their chance at success
- Announce the availability of funds for faculty projects and the deadlines so that interested persons have at least three weeks time for preparing and submitting
- Budget for more equipment for handicapped students and increased staff for the Learning Center
- Institute a training or awareness program for all staff to encourage more positive interpersonal relationships, raise our level of social consciousness, facilitate communication and respect of each other, and increase our knowledge, sensitivity, empathy, and dedication for helping our diversified student population
- Expand Training Services to each campus by establishing a Training Services Room for group or individual training, establish a Trainer on each campus so that staff will have more immediate access to individual help and technical support
- Create a network of instructors so they can observe and learn new or different effective ways of teaching, not to formally evaluate
- Employ alternate delivery of courses to increase the retention and success of students who need tutoring, review, or study skill building by offering varying numbers of sessions/week; example is prepared students meet 3 sessions/week for 3 credit hours and at risk students meet 5 sessions/week for 3 credit hours

Problems Identified by Native American students at Phoenix College

- Too few Native American Indian faculty and staff
- Current day care facilities are limited to 3-7 year-olds
- No official absence policy of excused absences for Native American Indian ceremonies, whose dates vary from tribe to tribe
- Housing facilities near Phoenix College are limited and often difficult to acquire
- Instructors do not understand and are not sensitive to grammar and pronunciation problems facing NAI students who have lived in tribal environments

Solutions suggested by Native American students at Phoenix College

- Recruit and hire more NAIs as faculty
- Have more NAI tutors in the Learning Center to help NAI students
- Provide NAI "mentors" that can advise, support, and guide NAI students throughout the entire school year
- Provide college awareness and orientation programs for freshman NAI students in reservation high schools
- Expand the day care facilities in terms of hours of operation and facilities/services/staff for children under 3 years of age
- Institute a policy regarding official excused absences for NAI students who participate in religious tribal ceremonies
- Create a NAI dorm or apartment complex that is close to campus
- Institute a training program for faculty and staff to increase their awareness of and sensitivity to NAI students.
- Design and implement college program changes that actually help change the status quo and represent real action, not just pity, talk, and data gathering
- Create and offer classes in NAI studies such as history, language, culture to help all students acquire a more accurate understanding and appreciation of NAI tribes, ceremonies, traditions, etc.
- Create and offer classes in NAI literature, prose, history, folklore, storytelling to help NAI students identify both with their heritage and the college, and to provide all student groups access to valid knowledge about NAIs

Problems Identified by PSY 240 students at Phoenix College

- Student security personnel working in the parking lots are rude to students and not helpful in providing useful information about parking policies or location of the security office
- Parking lot lighting is too dim, especially in the far areas of the south parking lot
- Advisors do not provide correct information about University program requirements
- Some college employees are rude or not helpful to students who ask for advice or directions

- Some mathematics instructors are not understanding or helpful toward students who have been absent because of illness with respect to making up work or tests
- No advisement or registration was allowed during the two days of campus or district employee meetings
- No honors program, classes, and scholarship awards are available to students taking night classes

Solutions suggested by PSY 240 students at Phoenix College

- Institute a training program to encourage faculty and staff to be positive, helpful, pleasant, respectful, and humane to students
- Design, staff, and implement an Advisement Center that is available to students at all times that the campus is open
- Extend the Honors Program to students taking night classes as there are many qualified, motivated, and needy students who can only attend classes during the evening hours

Problems Identified by Black students at Phoenix College

- Orientation of high school students before their senior year and their parents is too limited and and not effective as it should be

Solutions suggested by Black students at Phoenix College

- Implement orientation programs for minorities in high schools that are designed for freshman thru senior students; inform them in detail about financial aid programs and the procedures that they will have to go through to obtain aid; inform students of the varied programs of study that are available; inform students of the short and long term benefits of attending college; help them understand that college is for everyone, not just the rich or highly intelligent; utilize counselors and recent graduates give out orientation materials and explain them to the students.
- Develop an orientation program for the parents of high school students that contains most of the same information suggested for delivery to students in all grades in high school

Problems Identified at Gateway Community College and District Office

- Faculty have been denied personal computers which prevents their access to learning and using software relevant to their discipline and professional functioning
- Students are not allowed necessary access to computers
- Diagnostic Imaging Program does not have up-to-date PACS hardware, software, and phone line system appropriate for teaching current state of the art skills
- The financial procedures required to process invoices and petty cash vouchers are too complicated, inefficient, confusing, antiquated, and costly
- There is way too much manual (precomputer) multiple paper pushing, getting signatures, running around from office to office, etc. to finally have another person enter the financial transaction into the computer budget system at a terminal

Solutions suggested at Gateway Community College and District Office

- Institute a district wide policy that all full time faculty will have A1 in their offices if they desire it
- Institute a program and policy so that all students have equitable access to computer facilities and usage
- Establish a program for loaning out computers/modems to students and faculty for use at home for specified time periods
- Install a modern computer budgeting and financial reporting system that provides efficient, timely, comprehensive, and understandable information to all users
- Design and implement a new appropriate financial procurement process that makes use of existing computer system so that unnecessary paper work, footwork, multiple signatures, and time delays are reduced
- Create classrooms of the future with "learning walls" containing various kinds of video monitors and computer control to allow convenient and varied presentation of different kinds of information and demonstrations

Problems Identified at South Mountain Community College

- The staff are not adequately trained to know how to be effective representatives for attracting students
- Not enough full-time faculty teaching night classes
- No weekend classes for people who cannot attend during the day or evening class times
- Limited hours of access to computer labs for CAI courses and general computer usage
- Evaluation of part-time faculty is not consistent in the MCC District
- Inadequate parking and lighting for students taking night classes

Solutions suggested at South Mountain Community College

- Use video conferences to be able to offer the same course at multiple locations to avoid canceling classes with low enrollment and losing students to other campuses or totally
- Design and implement a program to train staff to effectively attract and recruit new students
- Re-assess the role of the Admissions Office with the possibility that the staff be trained as Admissions Advisors, not just technicians, in order to provide more advisement services to students when they register, and to also do off-campus recruiting
- Train and employ MCC students as recruiters at feeder high schools
- Offer weekend classes and student services
- Budget and arrange for computer facilities to be open more hours/day

Problems Identified at Paradise Valley Community College Center

- Faculty who have joined the "writing across the curriculum" movement experience a significant increase in their workload without any incentive to continue assigning and reading lengthy written assignments
- Late registration and drop/add are continuing to occur after the start of classes which requires a lot of unnecessary work and delays the functional beginning of class for many students; students who are allowed to start 2 or more class periods late are handicapped for doing their best and completing the course
- Lack of needed computer access to ASU and other state universities for easy up-to-date information about degree requirements for all major programs of study, which limits the orientation and advising of future transfer students

Solutions suggested at Paradise Valley Community College Center

- Fridays could be reserved for 1 day/week 3 hour classes and also for committee meetings
- Use student-instructor computer word processing network for writing assignments in English classes to provide faster feedback while rough drafts, etc. are being developed by students, rather than waiting to give feedback only after the final hard copy is completed
- Create computer networks so that instructors can view and comment on assignments between successive class periods
- Provide instructors with computers and modem access from their offices and home to computer networks used by students so that instructors can give better and more timely feedback in terms of instruction, grades and comments on class assignments.
- Locate electronic student information kiosks at several strategic locations to announce registration information, events, student awards, personal emergency announcements, etc.
- Create computer access to all state universities for the most current information regarding application, transfer, course equivalency status, and degree requirements for all major programs of study; this would greatly enhance the orientation of advisement of MCC students who plan to transfer to 4-year schools in the future

Problems Identified at Rio Salado Community College

- Developmental training for faculty is limited, inconvenient, and lacks administrative support and reward for participation
- Phone registration is too limited because it has not been integrated with existing computer technology to immediately check placement test scores, prerequisites, etc.
- Existing computer technology does not permit access to class schedule information between campus locations.

- District philosophy, policy, and class scheduling does not effectively serve students who have limited access because of time and/or distance factors
- Many students are prevented access to completion of degree or certificate programs because they reside and work at distant locations in the valley and required courses are not accessible
- There is not enough integration of computer software with course goals, competencies, and textbooks; not enough software directly aligned with the teaching process; faculty need to carefully select and/or create software that matches course objectives and has as much versatility as possible for multiple use by several courses if possible

Solutions suggested at Rio Salado Community College

- Create more open and less formal lines of communication for all faculty, staff and students to appropriate high level administrators
- Provide developmental training for faculty, staff and administration on how to think broader and more efficiently about what we plan and want to do in our specific departments and courses
- Provide computer administered, scored, and interpreted placement tests and use existing technology to make results available between campus locations
- Use computer technology to implement a complete phone registration program so
- Implement an integrated computer phone registration program which checks placement test scores, prerequisites, etc. so that students can register for any courses being offered
- Permit and utilize more flexible and creative scheduling of classes, such as variable monthly starting dates, days, hours/session similar to that employed by non-traditional universities (NOVA) and Arizona universities for extension courses at distant sites
- Develop new training for staff on how to effectively recruit various unique student populations, such as ESL, GED, minority, and socially disenfranchised students

Problems identified at Glendale Community College

- Early closing of classes during the registration period which results in elimination of classes that "at risk students" need in order to succeed
- Poor or minimal communication between departments; each department schedules classes without regard to how it may impact other departments and students

Solutions suggested at Glendale Community College

- Allow more time during the registration period for classes to fill before closing sections of classes that "at risk students" need in order to succeed
- Provide a better advisement procedure of "at risk students"
- Hire an additional staff person for the Testing Center and an additional staff person for the Learning Assistance Center
- Improve communication between departments so that more coordinated functioning with less negative impact will occur; integrated scheduling of classes so that class conflicts can be avoided
- Create and implement a program to provide more effective, enthusiastic, and realistic advisement so that students will be better able to plan and successfully attain appropriate educational and career goals

Problems identified at Scottsdale Community College

- Occurrence of a legal holiday on the Monday of the first week of classes in the Fall (Labor Day) or Spring (Martin Luther King Day) Semesters creates multiple problems of attendance, success, and accountability
- Many students have low or inappropriate motivations for attending and being successful in college
- Many students lack basic skills for success in any discipline that requires college level reading, English or mathematics skills
- Textbook readability may often be as much as 2 levels above the student's reading level which increases their risk of failure
- Continuing students who work off-campus may receive only partial financial aid awards because they can not take a "full 12-hour" academic load
- Inadequate program or process for motivating and rewarding faculty for excellent teaching, innovation, or professional developmental training

Solutions suggested at Scottsdale Community College

- Advisement process needs to be more comprehensive, involve developmental training of all advisors, and employ technology for tracking, periodic grade reporting, and intervention
- Create faculty discussion groups like the Excellence Team or Rouché Study Group to identify problems and potential solutions regarding issues of access, retention, at risk students, advisement, etc.
- Use Staff Development Programs to encourage more faculty to become aware of the many factors that affect the success of our students and ways that can potentially overcome some of the problems, such as textbook readability, testing, attendance, etc.
- Create a more realistic definition of full-time academic load for financial aid awards which takes into account a student's off-campus working hour obligations, so that students who must work can qualify for full-time financial aid awards without having to register for 12 credit hours

Problems Identified at Mesa Community College

- We are too limited in the ways that courses are taught (lecture and discussion, traditional labs) which do not serve students well who have different cognitive styles or learning problems that restrict their access to the information
- Visually, aurally, and other handicapped students who are not able to do traditional laboratory work are faced with additional frustrations or prevented access completely
- Much time and effort is utilized in finding specific limited information from our libraries because they lack modern computer facilities and organization; user must rely on traditional library skills of manually looking and walking and writing;

Solutions suggested at Mesa Community College

- Design and equip classrooms and learning labs with current state-of-the-art technology so that course material can be presented in a variety of ways to match different cognitive styles of students; provide multiple ways for students to learn
- Utilize technology to specifically provide easier access for handicapped and culturally unique students to course materials, especially traditional laboratory classes that require hands-on experience with actual live or dead animals, chemicals, etc.
- Convert our libraries to information banks with comprehensive data base searching facilities.
- Revise the computer literacy requirement so that it teaches useful process skills in education,

Problems Identified at Chandler/Gilbert Community College Center

- Managers and administrators too often lack periodic actual contact with students
- Too many managers and administrators are hired who have no education, experience, and/or interest in teaching which results in their not being student-oriented managers who are sensitive to both student and faculty needs
- Academic advisement is too often absent, erroneous, incomplete, confusing, not tracked, and not evaluated
- MCCD Training Services are not offering enough education to faculty for improving teaching and learning
- Lack of campus-based or community endowed student financial aid to help students during their first semester; the present dependence on federal aid programs often results in a cycle such that a student decides in August to attend college, registers, applies for financial aid, obtains a campus deferment for tuition and fees, begins classes without books, supplies and gas money, with the final result being the student is not prepared in class, does poorly, and/or drops out
- The readability of federal financial aid forms is too difficult and confusing for most students, which requires that students need a lot of support and help in order to complete the forms correctly and on time
- Some students are prevented access to traditional courses because they have emotional or religious barriers to working with real live or dead animals or chemicals
- Library lacks sufficient electronic access and duplication of specific information without having to search and retrieve an entire book, journal or document
- Lack of computer networks to provide accurate and convenient access to location and availability of library materials throughout the entire Valley

Solutions suggested at Chandler/Gilbert Community College Center

- Hire managers and administrators who have teaching backgrounds, experience, and/or an interest in teaching to facilitate such persons being student-oriented; have all managers and administrators teach at least one class per year so that they will have some actual periodic contact with students and have the opportunity to become more sensitive to student needs, concerns, problems, abilities, etc.
- All campuses should provide developmental training about financial aid resources and processes to all administrators, faculty, and staff to improve advisement, access, recruitment and retention
- Provide comprehensive library electronic search, retrieval and duplication of limited specific information from books, journals, encyclopedias, documents, etc.
- Design and offer short-term (brief) CAI or other types of modules for remedial courses in English, reading and mathematics
- Create and make available effective study skills and positive student motivation and role classes or workshops to improve student attitudes and behaviors necessary for success at learning in college; and evaluate such programs so that they can be modified in order to be valid (effective) intervention services (programs)

Report by the Ocotillo Action/Research Group

Library/Learning Resource Center of the Future

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Library/Learning Resource Center of the Future

We would hope that the technology of the future library would encompass the full richness of human light, that it would erase boundaries and leave no culture isolated beneath shadows of ignorance, prejudice and neglect. We see the student of tomorrow as a person with a truly global sense of human heritage; indeed, this student should live, will live, at the touch of a fingertip, within the vast accomplishments of the human spirit. If, as Byron said, "travel is the best education," the library of the future will greatly free ideas of the limitations of time and space. The library of the future, to fulfill its potential, should be a project of international concept; it should offer each and every student a place at the table of human thought and experience. Again, in my own field, language will be an ever more useful tool for the discovery of knowledge and of brotherhood, and the poetry of human thought will better survive and grow, given the full breath of technology.

Marie-France Ryan - French Faculty, SCC

Comments

Introduction

Student achievement lies at the core of every effort that we propose. In order to be successful, we must keep in mind that what we want the student to achieve is to learn how to learn, and since not all learn by the same method, a variety of high technology tools representing the different learning methods and styles should be available.

The following report is a summary of the hundreds of hours of participation by more than thirty members of MCCD. Due to the requested brevity of the report, there is a detailed file, which is not included, but which is available upon request, containing the problems identified and discussed. Possible solutions are noted, in addition to the logic and reasoning concerning each of the items. We feel very fortunate that the task force represented administration, faculty, staff, and student services.

In the beginning, there was apprehension about discussing the future of technology as it applies to the Lib/LRC of the future. However, there are some constants for today and for the future:

one, that a library functions as a central repository of knowledge; second, people will be able to retrieve vast resources of information at the touch of a finger.

The Library/LRC of the future must continue to support the colleges' mission of actively reaching out to the community that cuts across all generations in the lifelong learning process.

This task force recommends that this report be viewed as the catalyst for an ongoing project to review, edit, adapt, adopt, and help shape and nurture the vision and the future of high technology for the use of our library patrons.

The purpose of this report is not to set priorities; therefore, the order in which items appear is not indicative of the committee's preferences.

The following three areas have been the focus of our task force:

1. Databases.
2. Library/LRC fundamentals for the future.
3. Architectural design of the Lib/LRC of the future.

Databases

A subcommittee on databases comprised of nonlibrarians was formed to conduct an in-house survey on what is currently available and to explore faculty awareness of databases.

What an evaluation of databases demonstrates most clearly is that electronic databases will become absolutely essential in the library of the future. They are already an important part of any college library, and their importance can be expected to increase steadily with the continued development of information systems. They will not be alternatives; they will be necessities. In the community colleges, our obligation to our students will come to include preparing them for use of electronic databases in their future academic work. Moreover, the obligation of faculty to keep abreast of developments in their disciplines will require the use of electronic databases. At the same time, the present extreme costliness of databases, the fact that information systems are now in a state of rapid evolution, and the need to integrate multiple facets of a total library system, necessitate extreme care in the selection of databases. Because students need fairly simple access to popular magazines, while faculty need more sophisticated access to scholarly literature, balancing these divergent needs becomes a crucial task.

Disregarding cost, the five main criteria for evaluating databases are ease of use, capacity of the base and nature of the data, timeliness of the data, useability of results and access. The relative importance of these criteria shifts according to the user's needs.

For students, ease of use, useability of results and access are paramount; students need databases that incorporate on-screen tutorials and help-screens, and that feature easy means of tailoring a search. The faculty's expectations of the level of work required of students vary, but it is probably safe to say that most community college faculty do not expect students in lower division courses to conduct searches of scholarly professional journals. Popular literature is more likely to be utilized. In some areas extreme currency is also not of crucial importance, although students need to be made aware of and trained in accessing current material. In other areas, such as medical (nursing) fields, students need to be carefully trained in current access methods and resources.

CD Rom databases, such as WilsonDisc, are being introduced and used in some MCCD libraries. WilsonDisc is easy for students to use, indexes an extensive number of sources, and includes valuable abstracts. An important consideration is that students need access to the magazines that are indexed on the database, especially if abstracts are not available. Student response to WilsonDisc has been enthusiastic. Infotrac is also being introduced and used at other libraries.

CD ROM, however, generally does not provide enough access points for the large and growing number of students at all of our libraries. Some library committees have requested the loading of student oriented databases such as the Wilson databases, as has been done by ASU, to networked disk drives using the same software that students currently are using to access the online book catalog. This accomplishes the following:

- it makes the databases available at nearly 2,000 terminals throughout MCCD
- it eliminates the need to teach yet another searching strategy
- databases are accessible when library is physically closed

Nationwide faculty surveys show that what faculty want most is access to library databases from their offices. Although ease of use remains a significant factor, access to scholarly journals and ability to manipulate the search become more important. Currency of data is more significant for faculty. For these reasons dial-up online databases need to be available for faculty. Faculty need citations and abstracts from scholarly journals, and it is preferable that the user have the choice of calling up the



abstract or not. Ideally, full texts of articles should be available at the user's choice. Faculty who have been able to use services, such as Dialog, have responded favorably, primarily because it offers timely access to scholarly journals. Care must be taken in planning for dial-up access, however, as this involves the use of operational funds as opposed to capital funds. CD ROM databases, available through the existing Ethernet network, are an additional possibility.

Because use of electronic databases is still new and because many faculty have not become familiar with databases, the process of selecting types of systems and choosing specific databases should include the education and a survey of faculty to discover their interests, needs and expected uses. However, it is important to remember that, as with any technology, faculty who have never used electronic databases may not express interest and may not be able to foresee applications for their courses or their own research. Whatever databases are chosen, it will be imperative to offer training for both faculty and students. Once faculty have had an opportunity to experiment with electronic databases, their use will become more inviting.

The subcommittee was able to evaluate WilsonDisc, a CD Rom index of popular magazines; Dialog, an online indexes of scholarly journals, Magazine Index, an on-line index of popular magazines, NewsBank, and a CD Rom index of newspapers. Before an informed choice can be made, more databases and a variety of access methods from various locations should be evaluated.

As one of the nonlibrarian members of this subcommittee suggested, decisions on the databases should be made by our professional librarians since they know more about costs, vendors, demand, usage, etc., but faculty of representative disciplines should be kept on a committee such as this one. This will benefit all concerned.

Future Fundamentals

The following list is compiled from input from faculty, librarians and administrators throughout the Colleges. It is organized in two sections: Now / Later and Future.

Now/Later refers to those items which are currently in place or have, in some form been started, but require considerable augmentation and future support. Within the spectrum of participants' philosophies, there was one philosophy which cried out for the maintenance and augmentation of traditional services. Some traditional services, however, such as document

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delivery, will predictably evolve and transform to include systems and services of which have barely been thought .

Document delivery/Traditional services

- Increased **collections**
- Greater **periodical/newspaper** access
- Increased/improved document delivery from **external sources**
- **Online/full text** document delivery
- Online access to **original (perhaps unpublished) material**

Hardware/Network/System Resources -

- Increased **dial in** access to MCCD
- **External networking or dial out** access to external sources (e.g., transparent interface with ASU Library System)
- **Sufficient ports, terminals, printers, accounts, computing/processing sources, memory, storage, response time, network** for all students, faculty and staff
- **Classroom delivery systems**
- **Maintenance** support
- **Workstations**
 - designed for **human factors**
 - windowing, cut/paste from original, internal and external sources
 - full audio, full motion video

Budgetary Commitment -

- Sufficient **operational and capital** support
- **Human and technical** support
- **Acquisition and maintenance**
- More funds for **dial-up online searching**

Resource management -

- **All MCCD resources online** catalog, including labs and departmental collections
- **Assist Departments** in managing information resources
- Include **software**

Human aspects/Training -

- **Assessment of students' learning skills**
- **Library instruction** across the curriculum, from individual to entire classroom
- Stronger library role in **teaching the use of systems and information access**
- **Computer assisted instruction / online tutorials**
- Adequate **staffing** to support systems

Future - refers to those items which are in the planning stages and which we expect to see started, at least somewhere in the District within the next two years. As mentioned above, they will

require ongoing commitment and support.

- **Databases** - there are currently **thousands** of information retrieval databases which are relevant to the mission of the Colleges. With the exception of the MCCD book database, students, faculty and staff have limited access to databases.

- Student access - due to our high volume of students and the nature of their information needs, the loading of **general subject databases** to **shared districtwide** disk drives has been planned. This will allow a **high volume of multiple simultaneous users** throughout the network.

- Colleges are also acquiring individual **CD-ROMS** for use on single use stations which can be accessed from within the library when it is open.

- Students will be able to personally **enroll in a course online** and have the **bill sent** to them in the mail.

- Faculty/student access

- **Networked CD-ROM** access for lower use **specialized subject databases** which will allow access from anywhere in the MCCD network, **24 hours/day**.

- **Access to instructor information**

- make appointments
- office hours / schedule
- midterm and final exams under proctored environment
- computer grading of tests, item analysis, etc.
- final grades electronically moved from faculty record to student record

- **College Bulletin Board**

- information on College policies
- procedures
- calendar
- special events
- check enrollment status
- program plan (e.g., MAPS)
- review syllabi for courses

Image

- automation of image management
- digitized images
- high resolution

Hypertext/Hypermedia

Internationalization/World Centers

- **Global library** within the reach of all patrons

Library/LRC Infrastructure

Interfaces -

- Cross disciplinary Usergroups with faculty and student representation
- Integration of disciplines
- Faculty involvement in library issues
- High School linkages
- Lifelong learning
- Focal point for workshops and seminars of community interest

Architecture

Flexible is the adjective to be used with all the architectural facilities of the Library/LRC of the future. In designing the library we must keep in mind the two main users of Library/LRC : the patrons and the staff.

We strongly recommend that any future building, remodeling, and modification of Library/LRC building be done only after reading the research and findings of the file accrued by this task force. There are some checklists that would eliminate many of the problems that we have had in the past.

The physical design of the library should reflect aesthetically the region where the college is located. It should reflect the haven and refuge and light that all knowledge proffers. There should be vitality about it in the form of live plants, windows that show the sky as the limit. There should be a combination of natural materials that belong to the earth, much as the human beings do.

After studying and extensive body of published and unpublished articles pertinent to our task and after an in-house survey of what is presently available and what is needed, the following list reflects some of the most salient needs that must be met in order for the library/LRC to advance into the next century and to emerge as the central network of knowledge facilitation and still be part of the public domain.

In the future connectivity between the library and the hi tech center, labs and student services will need to develop and bring about new relationships of cooperation and integration.

1. All computing facilities need to be networked, especially those from student workstations to online services.
2. Proportionate number of workstations for students doing research projects.

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Who has these checklists?
How will they be disseminated?

Ⓜ

Ⓜ

(List of 26 recommendations follow.)

Comments

3. Writing Program Computer facility should be networked and part of the Library/LRC
4. Optical Scanners should be centrally located.
5. An ongoing library lab to experiment with the state of the art technology as it appears.
6. Several multimedia workstations for hypertext using sound and video.
7. The Library/LRC should house non-print materials and a facility to store and distribute them in electronic forms.
8. Space should be provided for group study and group projects.
9. Delineation of space should be flexible yet defined according to the different learning styles.
10. Space should be available to accommodate videotape library, software library, audio library, and print material in digital form.
11. Space to accommodate interactive videodisc stations.
12. Communication ports at all workstations
13. Teleconferencing room
14. Sophisticated distribution of cabling should be flexible at all times to accommodate future additions, modifications.
15. Carrels need to be different than those that we have now in order to accommodate the increasing number of lap computers to be used in conjunction with other electronic material. All should include outlets.
16. Low-glare lighting is a must.
17. Systems furniture needs to be flexible.
18. Carpeting should be modular.
19. Walls need to be movable yet at the same time they should be able to bear shelving.
20. Teaching library lab/classroom to instruct on an ongoing basis.

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(List of recommendations, 3-20.)

Comments

21. Stations should be placed strategically throughout the library to accommodate CAI Online tutorials.
22. In the future, because of communication technology and connectivity, there will need to be developed new relationships of cooperation between the library and the hi tech center .
23. The physical location and proximity and flow among media, learning assistance, learning resources, labs, student services and hi tech center should be of utmost importance, especially since improved coverage and better hours could be gained by leveraging physical and human resources.
24. Mini-computer/word processing/typing facilities should be housed in the library/LRC.
25. Noise management must be designed into the facility.
26. Security systems and design must be as sophisticated as the equipment they are protecting.



(List of recommendations,
21-26.)

The following is one person's beautifully expressed vision of the future offered to the group:

**Narrative Contribution, Dr. Joyce Elsner, Administrative Dean,
GCC**

As a place, it is open 24 hours a day, 352 days per year. It is accessible on the campus, from the home, from the office. From workstations, wherever a learner might be, data bases can be accessed, original material can be called and reviewed, visuals can be displayed, videos can be watched, and if appropriate, sounds can be heard. I think of a student wanting to learn more about the Grand Canyon....who can search the databases, call up the articles or chapters or abstracts, who can go on a visual tour thru slides or video, all the while listening to the Grand Canyon Suite (After all, we do want to engage both the right and left brain in learning!)

If the student/faculty/learner is doing research to write a paper, the learner would be able to wander thru the original source material, cut/paste/footnote easily into the document they were building on a micro with a word processing program. Most the print resources would now be available in electronic/digitized form for technology access.

Comments

In addition to the "traditional" library resources that would now be available to students and staff, the same terminals would be able to access a college bulletin board, from which they could get info on college policies, procedures, calendar, special events, check their enrollment status, program plan (a la MAPS), review the syllabus for the course(s) they are taking, check assignment due dates, check availability of courses for the next semester, find the course(s) they want to take, book it, and have the bill sent in the mail with a specified due date. They could also leave notes for faculty members, book appointments with them, check their schedule for office hours.

For many of their courses, the midterm and final exams could be taken on-one line in a proctored environment. Faculty would be able to have the computer 'grade' the tests, run it against the scoring range determined by the faculty member, produce an item analysis of the test for the faculty and faculty would be able to record the grade for storage and final semester end calculations. Final grades would move electronically from the faculty file to the student record and students would be able to check their final grades on-line or could wait for the grade card in the mail.

This facility would also have access to uplink and downlink facilities for the transmission and receipt of information. It would also be the focal point for workshops and seminars on community interest. With the technology ability, this new place would be viewed by community residents as having a strong outreach component as well as the traditional "come to us" focus.... because people would have a choice of participating at the site or from a distant location.

Because of its long, open hours, the facility would provide for learners of all ages, including the children of adult learners. While a research library might have nothing of interest for children, a community college facility would have such things so that the young people could build a comfort level with the services, and also, possibly develop the comfort level with the college as a whole and incorporate that feeling into their overall feelings about the possibility of college in their future.

Yes, training and retraining would be available for all who work there. The staffing needs would be accommodate as a result of the broader and more complex mission. The technical support would be available. On most campuses today, the organizational movement is toward a helix of computer services and library services. By the time this 'library' is real, the organizational/reporting/partnership issues will have been resolved with each formerly separate organizational unit now so intertwined that they cannot remember the old pattern. The blending of skills/interests/abilities/purpose will have occurred.

Comments

Closing remarks:

This document is just a beginning. It is important that it not be seen as a final compilation of input but as the start of the development of a future vision for libraries, learning resources, learning assistance, learning technologies and student services. A true vision of the future must be developed and built with input and involvement from all users.

Report by the Ocotillo Action/Research Group

Planning for Information Technologies Facilities

by Jim Jacob, Chair - GCC
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Planning for Information Technologies Facilities (DESIGNING COMPUTER FACILITIES)

Background and Need Statement:

During the past four years, the Maricopa Community Colleges have begun major Capital Development Programs that have included massive construction/remodeling projects at each college and at the district office. As these projects began, it became evident that there was insufficient planning for voice, data and video communications requirements in new and remodeled facilities. What has resulted, therefore, are buildings with limited conduit systems, television production facilities with insufficient ceiling heights to allow for lighting grids, rooms with insufficient electrical power to allow for the use of information technology equipment, and significant number of telecommunications change orders to construction budgets to add voice/data cabling not included in the original budget requests.

After four years, we have come to know the basic voice/data/video cabling requirements that must be included in all new construction projects and all major remodeling projects. We have also come to appreciate other areas of facilities planning where there are not the clear cut standards that exist in the area of cabling.

The Ocotillo Research/Action group assigned to assess "Planning for Information Technologies Facilities" has, therefore, divided itself into several subgroups to examine the following topics:

1. Technical specifications/standards for voice, data and video communications cabling and cable plants
2. Ergonomics
3. Engineering and environmental concerns
4. Hardware security systems
5. Voice/data/video presentation systems

Questions and Answers:

As the Research/Action group met during the 1988-89 academic year, the various subgroups mentioned above worked to develop and then to answer the following questions. The first question deals with specifications and standards that have been established through the work of the Telecommunications Improvement Project and can be easily followed by college personnel and planning department staff. The other questions, however, cannot be as fully addressed because the planned use of individual rooms and/or buildings at each college must be taken into

Comments

Comments

consideration when the subjects of ergonomics, environmental issues, security and presentations systems are discussed.

It must also be noted that this report can in no way be viewed as complete because specifications/standards are constantly changing or evolving as hardware and software applications change and evolve. This Research/Action group must continue to function as an updating group to continue addressing the following questions.

Question 1: What standards exist/should exist for voice/data/video cable plant facilities?

Answer: There are several existing standards that must be followed throughout the Maricopa District as new buildings are constructed, as buildings are remodeled, and as voice/data/video networks are expanded. These specifications/standards are as follows:

Cable Plant Standards

1. Baseband/Ethernet

- a. Standard (thick wire)Baseband Ethernet Cabling:
 - 1) A single cable segment can be up to 500 meters (1640 ft)
 - 2) Multiple cable segments can be linked together with barrel connectors. A maximum of 100 transceivers (H4000)can be used on standard Ethernet cable segment. A repeater or bridge connects segments of Ethernet coaxial cable, creating larger local area network.
- b. ThinWire Baseband Ethernet Cabling:
 - 1) ThinWire Ethernet cabling runs using BNC connectors can be up to 185 meters (600 ft) and are connected to thick wire segments via a DEMPR.
- c. Specification details on Ethernet can be obtained from:
 - 1) Systems Manager at Information Technologies Services (ITS)
 - 2) Account Executive at Digital Equipment Corporation (DEC)
 - 3) Documentation such as "Networks and Communications Buyer's Guide" from DEC.
- d. A network configuration map has been developed and is included at the end of this report.
- e. Other local area networks (LANs) which may be connected to Ethernet
 - 1) AppleTalk
 - 2) 3Com
 - 3) Novell

Through what process do we experiment to know when a standard should be changed? Who changes it? Who pays for the change?

2. T1/DS1

- a. Description of the current intercollege microwave network:
At the present time there are 12 T1/DS1 links between GCC, PC, RSCC, PVCC and the relay point at Shaw Butte. There are also 12 T1/DS1 links between SCC, CGCCC, SMCC and the relay point at MCC. There are 28 T1/DS1 links between Shaw Butte, MCC and the District Office/GWCC location. (See microwave network configuration map).
- b. Voice Connections to T1
A T1 interface between the NEC NEAX 2400s and the digital microwave system is responsible for carrying voice traffic among the college locations. The interface is accomplished through use of T1 cards in the NEAX's themselves.
- c. Data Connections to T1.
A CSU/DSU is connected to VitaLink bridge serves as an interface between the computing systems at each location and the microwave transmission system.
- d. Video Connections to T1.
Work is currently underway to develop specifications for connecting video devices to the T1 channels.
- e. Specification details are available from ITS personnel as well as from US West Information Systems and SanBar Corporation. NEC America is the source for information regarding video connectivity.

3. Coaxial-based Broadband

- a. Cable specifications for the broadband system are contained in the Telecommunications request for proposal (RFP).
- b. Headend specifications are being developed at the present time by a subcommittee of the districtwide Telecommunications Users Group in conjunction with outside consultants.
- c. Drop specifications for video jacks are contained in the Telecommunications RFP.
- d. Frequency allocations have been addressed to a certain extent by Chandler Gilbert Community College Center and Phoenix College. This issue is also being explored by a subcommittee of the districtwide Telecommunications Users Group.
- e. During the installation of cable plant for the Telecommunications Improvement Project, discussions were held regarding the possibility of using the coaxial based broadband network for data transmission among buildings at the colleges. These discussions culminated in decision to reserve the broadband system for video communications because of the cost of data connecting

devices for broadband and because of the maintenance required on broadband systems used for data communications purposes.

NOTE: Specifications details for (1) twisted pair wire and (2) pin outs/connectors/termination devices were not included in this report in order to conserve space. Information concerning topics in the following outline can be obtained from ITS.

4. Twisted Pair

- a. Jacks and wire usage
 - 1) Main "a" and "b" jacks
 - 2) Use of spare pair(s)
- b. Cross-Connects
 - 1) Standards for connections to NEAX 2400
 - a) Dterm V
 - b) Dterm II
 - c) Data modules
 - d) Trunk, FX, T1, WATTS, and other services
 - 2) Standards for connections to DEC Terminal Servers
 - a) DECServer 100's
 - b) DECServer 200's
 - c) DECServer 500's
 - 3) Wire color
 - a) Digital telephone
 - b) Analog telephone
 - c) trunk and carrier
 - d) Subclosures
 - 4) Size of voice cabling for each individual building should be based upon ratio of 3.36 pair/jack leaving the building and connecting to the Main Distribution Frame (MDF) at the location.
- c. Documentation standards
- d. AppleTalk
- e. Reference Documents
 - 1) PhoneNet Users Guide
 - 2) Telecommunications Improvement Project RFP
- f. Recommended vendors

5. Pin Outs/Connectors/Termination Devices

- a. Terminal hoods
- b. Macintosh connectors
- c. Data modules
- d. Serial connectors for MS-DOS machines
- e. Data adapters
- f. Printers parallel serial
- g. AppleTalk devices (PhoneNet, CompuNet, ModuNet)
- h. Reference Documents
- i. Recommended vendors

6. Entrance Facilities/Outside Plant Conduits

- a. Telco entrance facilities are required to bring twisted pair from the Central Office to the college location for voice/data communications. This requires a minimum of one 4" conduit for copper entrance facilities from the Main Distribution Frame to the US West Communications point of presence. A minimum of a 300 pair cable should be installed for each new college location.
- b. A separate 3" entrance conduit should be installed for fiber cable from the US West Communications point of presence to an identified interface(s) for voice, video or data communications.
- c. Building entrance facilities, for the exclusive use of voice, data and video communications, must be provided. A minimum of three 4" conduits for voice/data/video communications and minimum of three 3" conduits for other uses should be planned for each new building. This will provide sufficient conduit for voice, data, video, intercom, fire alarm, etc., but does not include conduit for basic electrical feeds. All conduit shall be equipped with mule tapes to ease installation of new cable.
- d. Fiber optic cabling should be contained within innerduct to provide protection and to maximize the use of conduit space.
- e. The Main Distribution Point at each location should have a minimum of six 4" conduits leaving the building for voice/data/video communications. This assumes there will be no more than two major routes leaving the main distribution area, each containing major conduit for voice, video and data cabling. An innerduct should be included in at least one of the 4" conduits on each route.

7. Conduit within Buildings

- a. Size of conduit to individual voice/data jacks shall be 3/4".
- b. All internal conduits for voice/data/video communications shall be home runs from the jack back to the appropriate distribution point. Each conduit should be installed with pull strings.
- c. Size of conduit to video drops shall be 3/4".
- d. Junction box specifications (see Telecommunications RFP) including face plate specifications and height of jack locations.
 - 1) Voice/data
 - 2) Video
- e. Conduits for electrical outlets should be placed in close proximity to the conduits for voice/data/video communications.
- f. Teflon coated wire must be used when it is exposed in plenum spaces (air return).

8. Relationship of voice/data/video communications to electrical environment.
 - a. Shared facilities
 - 1) Voice/data/video communications systems that are placed in the same trenches as electrical wiring must be isolated from the electrical systems.
 - b. Grounding
 - 1) Proper grounding must be provided at each building
 - 2) Consistent grounding must be provided among buildings on campus
 - 3) Grounding in the Computer Room/Network information center must be checked on a regular basis to insure integrity of all systems connected to the ground.

9. Wiring Closets
 - a. Main Distribution Point
 - 1) Physical layout of the main distribution frame, including cross connects, blocks, etc.
 - 2) Relationship of voice to data and voice/data to microwave
 - 3) Length of cable runs to satellite distribution points
 - 4) Environmental requirements
 - 5) Wire color-coding
 - a) voice
 - b) AppleTalk
 - c) Line driver
 - d) Ethernet
 - e) Other devices
 - b. Satellite Distribution Points
 - 1) Building distribution frame (BDF)
 - 2) Intermediate distribution frame (IDF)
 - 3) Length of cable runs to jack locations, voice, video and data.
 - 4) Environmental requirements
 - c. Separation of voice/data/video wiring closets from electrical and/or housekeeping closets and mechanical rooms.

Question 2: What are the ergonomic issues that must be addressed in new/remodeled or existing facilities?

Answer: There are many areas that must be taken into consideration for the health, safety, comfort and productivity of staff and students. The Research/Action Group has compiled information in the form of articles, publications, vendor information and even legal documents on the following ergonomic issues.

- A. Lighting/vision
- B. Air circulation
- C. Acoustics
 - 1. Room acoustics
 - 2. Acoustic Devices
- D. VDT emissions
- E. Furniture
 - 1. Workstation design
 - a) square footage/workstations
 - b) number of workstations per square foot
 - 2. Chairs
 - 3. Shelving/storage
 - 4. Accessories
- F. Wall surfaces
 - 1. Color
 - 2. Texture
- G. Floor coverings
 - 1. Color
 - 2. Texture
- H. Health considerations

Question 3: What engineering/environmental concerns must be addressed in the construction/remodeling of technology facilities?

Answer: Again, the Research/Action Committee has compiled vendor information, recommendations and articles on the following topics:

- A. Airborne contamination
- B. Power Distribution Units (PDU)
- C. Uninterruptible Power Supplies (UPS)
- D. Air handlers for temperature humidity control
- E. Flooring systems
- F. Fire suppression (halon)
- G. Static suppression
- H. Site selection preparation
- I. Network center design
- J. Electromagnetic interference

Question 4: What types of hardware security systems should be utilized?

Answer: Information has been gathered on the following types of security systems:

- A. PC based Security System (cannot locate system which run on a VAX)
- B. Uninterruptible Power Supplies for security systems CPUs
- C. Card Access/Keypad Based Systems

Comments

- D. Electric Door Lock Mechanisms
- E. Rf based security systems
- F. Video monitoring systems
- G. Retinal scan ID systems
- H. Thumbprint ID systems

Question 5: What types of voice/data/video presentation systems must be considered as facilities are built/remodeled/re-equipped?

Answer: The Research/Action Committee was very concerned that designers of new facilities take into consideration the potential of using these facilities for video and audio teleconferencing as well as for demonstrations of video, audio and data communications. Therefore, information has been gathered on the following:

- A. Display systems
 - 1. NEC DM2600 and DM3000 data monitors
 - 2. NEC DP1200 data projection system
 - 3. Kodak LC500 data projection systems
 - 4. Mitsubishi 3700 data monitor
- B. Audio teleconferencing
- C. Video teleconferencing

RECOMMENDATIONS

1. A set of cable plant facilities standards should be compiled and disseminated in both hardcopy and electronic formats to each college.
2. A "library" of reference materials/documents will be compiled and made available to college/district staff via the data communications network using some type of optical storage devices attached to the Ethernet.
3. An ergonomics workshop will be developed and scheduled for district/college personnel to acquaint them with the ergonomic issues and some potential solutions/approaches.
4. An individual/group of individuals, composed of college and district office ITS personnel should be established to review all construction/remodeling plans to insure that requirements for dealing with voice, data and video issues are appropriately addressed.
5. Review sessions should be developed and held for such districtwide groups as ITEC and CDEC to alert them to overarching issues including established standards.

Comment: Let's develop a workshop for using these materials in writing "ed Specs" and in reacting to the architect's design.

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Comments

6. A list of architects specializing in designing technology-based facilities should be established and such vendors should be given preference during any type of bidding process for new construction or remodeling projects.
7. Because of the rapid changes in technology, the efforts to establish standards and to deal with the consequences of technology must be ongoing and should be viewed as being primary responsibility of ITS in conjunction with districtwide groups such as the Telecommunications Coordinators, the Computer Coordinators, College Computer/Technology Committees, etc.
8. When any facility has as its primary function, the use of technology to serve staff/students, representative from ITS shall be assigned to work directly with the appropriate college/department to serve as liaison/advocate between the college, the planning department and/or the architect to insure that appropriate technology standards/considerations are met.

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Report by the Ocotillo Action/Research Group

Staying Current with Technological Change: Implications for Internal Training and Development

by Jamie Cavalier

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Staying Current with Technological Change: Implications for Internal Training and Development

Comments

A. **Perspective:** When the group first met at the All-Faculty Convocation in January, we recognized that "training" could be defined in many ways. We realized that the questions that we were asking revolved around two key items, first, technology training for employees and second, bringing technology into the classroom to enhance teaching.

B. **Questions:**

- How does technical employee training occur?

To answer this major question, all members have been compiling a list of informal and formal training taking place at each site. At the next meeting (April 12), the group will finalize this list of site training.

- What technology is planned for the future at MCCCCD?

Ron Bleed joined our group and related to us what he envisions as the future for Maricopa. His sharing of technology long-range planning will contribute to future directions of the group.

The following are unanswered questions:

- How can the findings of the group impact future training?
- What kind of training is most effective?
- How can the district foster effective future training?
- What means can this group identify that would contribute to the construction of the 1992 bond?

C. **Recommendations:**

We have not met long enough to recommend anything at this point. We hope to in the near future.

Technology, Learning Theory, and Curriculum Restructuring

(Integration of Learning Theory, Content, and Technology)

by Julie Bertch, Chair - RSCC
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Technology, Learning Theory, and Curriculum Restructuring

Comments

The Ocotillo Action Research Group on Technology, Learning, and Curriculum Redesign conducted several small group meetings and teleconferences during the last year. Over 50 faculty and administrators participated in discussions. This dialogue led to the identification of common technology, learning/teaching, and curriculum concerns. Many faculty were only able to attend one of these meetings, others joined us repeatedly as we continued to explore the teaching and learning issues of a technological era.

Our discussion throughout the year have led us on an interesting journey of analysis and re-thinking. We did not find answers, but we did discover recurring issues and questions. Above all faculty are calling for support in exploration of possibilities and the development of projects that focus on how to integrate new approaches into their classrooms.

Reflections on Teaching, Learning, and Technology

What we know about the nature of knowledge tells us that the content's experts understanding of a body of knowledge may be quite intuitive and not easily explained, consisting of the ways of knowing or understanding that an insider, an expert, would use to link the content. The structures and organizational schema that students need to learn may be different from those that practitioners use.

The history of science demonstrates that knowledge is dynamic. If we are going to treat knowledge as dynamic, then students must develop useful knowledge structures so they can evaluate information, relate it to their present knowledge, and construct something new out of it.

Technology can enable this refocusing on building knowledge structures—data perceived as meaning rather than facts. And technology may dissolve the distinctions between fields, integrating studies by taking advantage of the natural overlap among disciplines and thereby making learning goals more real.

What we know about learners and learning tells us that we must focus instruction on knowledge integration versus memorization of a body of knowledge—successful learners have schemas that allow them to hook or anchor new information to existing knowledge. We need to teach content structure and strategies for application of knowledge rather than simply a specific body

of content. Students need to be introduced to obvious, step-by-step strategies which reveal the interconnectedness in a body of knowledge. Students need to know something of the automatic connections that somebody who lives in the field knows.

What we know about students tells us that their biggest problem stems from their view of the learning situation and their role within it. Characteristic of these learners are (1) their expectations about what learning is supposed to be—the gathering of intact, fragmented bits of information, and (2) the unconscious routines they use for accumulating this data. These unconscious routines are often neither effective nor efficient. Students need to learn how to learn.

What we know about technology tells us that it is largely an untapped resource for applying what we know about knowledge, learning, and students. Those interested in examining the impact of the new technologies find an intriguing but undefinable situation. For example, students who learn to write on a word processor learn to think about writing in a different way—less linear, more dynamic, less “finished.” We know that the product is changed by the process of using the technology. We believe this provides a rationale for exploring ways technology can impact other aspects of the teaching/learning process. We would expect to find indications for curriculum, as content is affected by new possibilities; for teaching, as new methods call for emphasis of the dynamic nature of knowledge; implications for students skills, as new methods emphasize content structure and application of knowledge to relevant problems.

Reflections on the Future

What we believe is that curriculum will be redesigned with knowledge taught as a dynamic versus static entity. Textbooks lose their central position the sources of information for a course with information being accessed via databases. Students will access multiple sources of information and explore diverse perspectives as they pick and choose resources needed to solve a problem. No longer will faculty be restricted to a favorite textbook that presents one author’s synthesis at one point in time.

What we believe about students is that they will have to shift from collectors of information to analyzers of information. Students will need to learn to explore data for meaning rather than perceive data as the meaning. Student will need to learn new fields by understanding the structure of the field and manipulating data.

Students will have to shift from perceiving themselves as passive receivers of information to learning how to function as active learners, to seek out, analyze, and purposefully acquire information, and at the same time recognize and practice useful

Isn't it a bit radical to talk about not using textbooks?

learning strategies. They will need to discover a personal connection with learning and intrinsic rewards that make it meaningful. They will need to become more aware of their own interests and needs and actively seek to meet them, engaging in problem-solving as a routine approach.

They will need to evaluate their own skills and strategies realistically, understanding the demands technology makes of them. They will need to expect to read, write, and compute adequately and to take on individual challenges for learning. They will need to set their own goals for college.

To improve their chances for success, students will need to learn to take advantage of existing support services, including those found in the current college structure and those they create themselves—taking responsibility for their own educational behavior and seeking the help they need.

What we believe is that the faculty role will shift. Faculty will need to develop a view of teaching as helping (coaching, leading, directing) students to observe and understand ideas, to generalize and modify theory, to accommodate emerging information within existing structures. However, giving up their roles as givers of knowledge to become co-explorers and problem solvers will be a difficult transition for many. Many will persist in teaching knowledge as static and resist a shift to teaching a changing knowledge base.

Faculty will remain as the key orchestrators of the learning environment. Expertise in the interconnectedness of the ideas and theories of their content domain will be the foundation for teaching and learning. Thus, as Shulman has stated, those who can do, and those who understand will teach.

What we believe is that technology will increasingly be used as a tool by faculty and students. It will be used to interfere with students' existing learning routine, to intervene in their learning processes, so that we can orchestrate a restructuring of knowledge. It will be a tool designed to help students analyze information and link it to existing structures. It will be a tool for writing, thinking, computing, and communicating.

Access to higher education will require home access to technology. On-line access to information will become an essential skill and requirement for learning.

Guiding Questions for Exploring Change

What has emerged are questions we must address as we strive to meet faculty and student needs in our emerging technological environment. We have summarized the key questions raised

The Where/How group also mentions changing faculty roles.

over the course of the year which relate to the issues discussed above.

1. How might technologies affect the ways courses are put together—reorganizing information, blurring disciplines distinction, providing alternative modes of presentation?
2. How might the technologies change the learning environment—time, place, schedule, teacher/student interactions, student/student interactions?

The Faculty

1. What skills and/or knowledge would an instructor need to use these technologies?
2. How could an instructor best become and remain current in that technology?
3. How can instructors share expertise about technologies?
4. How can instructors be encouraged to create innovative uses of technology?

The Students

1. How could technologies provide alternate ways of learning?
2. How could technologies make students more independent learners?
3. How might technologies provide the means and the impetus for integrating discrete learning into more meaningful concepts?
4. How might technologies affect the approaches and the processes students use in learning—the way they deal with information.

The Change Process

What we know about change tells us that "...single most important factor in any change process is the people who will be most affected by the change." (Managing Change, p. 29) To be helpful to faculty, we must provide the support they need when they need it.

The issues here concern faculty perceptions of themselves and their work. Many instructors are not comfortable with the new technologies. They are only beginning to understand what the possibilities are for developing and presenting material. They continue to see their content as a prescribed body of information and students as receivers of that information. These people

need a way to discover the resources and create their own techniques efficiently.

Many faculty are overwhelmed with the technological possibilities and their own inadequacies in understanding, dealing with, and using them. They need effective means for communication and interaction among themselves, encouragement for risktaking, support (both funding and personal) for efforts toward growth, and a reliable means for dealing with unsatisfactory outcomes. Most of all, they need time to think, to talk, to plan, to design, and to create.

We also know that to be truly helpful to faculty in implementing change, we need to be able to describe what it is they need to be doing. This is in fact our dilemma. We cannot define what the change will be: that synthesis is yet to occur.

Thus our challenge is to create an environment that enables faculty to rethink, reshape, and redesign what and how they teach. This requires integrating what we know about knowledge, what we know about students and learning, and what we know about technology. However, faculty need expertise in each of these before they can integrate them.

Currently in MCCCCD, we have faculty working on one or more of these components, unusually one. For example, a number of faculty are using technology for teaching, others are using critical thinking, writing-across-the curriculum, or 4-MAT. A few are involved in rethinking what the content of the curriculum should be given technological and demographic changes. However, seldom are these faculty knowledgeable in technology, learning, and curriculum redesign.

To provide a climate where all three components can be addressed will require we rethink the types of experiences faculty will need to explore and ponder the interconnections of these areas. As a starting point, we are recommending that the following stages or phases will be a part of what is needed to enable faculty to explore and link ideas, design projects to integrate these approaches into their teaching, and rethink and evaluate the implication of their work.

1. Information/Discovery opportunities

This is a college/center based effort that includes groups of faculty/staff who are interested in learning more about students and learning, knowledge, and technological possibilities. These groups need to be provided with information about innovations, discuss possible implications, go on field trips, observe demonstrations, and discuss possibilities. This phase is recursive, continually providing faculty opportunities for learning and renewal.

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Ⓜ

Do we know when a faculty member would know enough of technology, learning theory, and curriculum redesign to proceed successfully with the integration of them?

2. **Exploration and project development**
During this phase faculty need opportunities to develop and implement pilot projects that integrate what we know about students and learning, knowledge, and technology. They need to work through "how" to accomplish what is possible. This phase is resource intensive because faculty (or clusters of faculty) not only need equipment for development and implementation, but they also need block of time for evaluating and assessing the effectiveness of their work.
3. **Rethinking/Strategy Development**
In this phase, faculty need opportunities to rethink their projects and ideas. They need to be linked with others working on projects and discover their interconnectiveness. And, they need opportunities to develop strategies for sharing what they have learned with other faculty.
4. **And, faculty need to be a part of a collegial "community"**
that enables ideas to spread and evolve. They need administrative support for their efforts; they need a campus climate that encourages questioning and exploring, one that provides support and opportunity, one in which the norm is lively dialogue on teaching and learning.

Where are We Going and How Do We Get There

by Mark Montanus, Chair - GCC
Ron Bleed, Coordinator - District

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Where are We Going and How do We Get There

This report is in three parts. Part I is an introduction to kinds of problems that were addressed. Part II raises the appropriate questions regarding the problems and part III is a series of recommendations related to the problems.

Comments

Part I: Introduction

The breadth of responsibility suggested by the title of this Sub Committee could well encompass all the responsibilities of the entire Ocotillo project. As a beginning point, this committee did review the broad scope of needs and problems in the use of technology and did develop a rather comprehensive list. Upon further study, it became apparent that our list fell into three distinct groupings.

Group A - Priorities already being address by existing Ocotillo groups. It is the desire of this group to give full support to the Ocotillo subcommittees currently dealing with these priorities. This list includes:

- Futuristic facilities
- Networking
- National and international databases
- Partnerships
- Across the district sharing of ideas and courseware
- Standardizing operating systems
- Inter-campus sharing of expertise

No further questions or recommendations will come from this committee regarding the above list but be advised that we consider them to be of the highest priority and fully support the Ocotillo subcommittees addressing them.

Group B - Priorities which need to addressed outside of this sub committee by on-going district sponsorship. Technology is causing radical change in teaching strategies. New kinds of courseware are being developed and new courses are being created. The operation of short-term and open-entry/exit courses seems to cause great difficulty in our traditional setting. The changing role of faculty and support staff is upsetting to our system.

These kinds of problems and others must be approached on a district wide level. A series of meetings held by our sub committee with teachers and administrators has revealed that each campus is attempting to solve the same problems. It became apparent that the campuses were willing to develop a common front in dealing with them. The problems in group B have a pervasive effect and must be solved on the broadest possible scale.

This sub committee has spent considerable time attempting to define the above problems which you will find detailed in Part II of this report.

Group C - Priorities which can be implemented directly by this committee. The committee discovered specific areas of concern that can and must be addressed now. Some of these can be implemented immediately with the appropriate approval. Others will be ongoing concerns with leadership provided by this committee. Part II of this report will raise the appropriate questions and Part III will contain specific recommendations that will address the questions raised in Part II.

The areas of concern in Group C include:

- Establish a philosophical basis for technology
- Encourage and nourish innovators
- Define the variety of technical laboratories
- Staff training and development
- Database of information about innovative projects

Part II: Questions

Questions will be presented regarding the priorities of group B and C as discussed in the introduction. This part begins by presenting questions raised by group B which must be addressed in the broadest possible manner within our district.

The bulk of the questions result from the attempt to deliver instruction in the non-traditional mode. Technology is bumping the comfort zone of all elements in our district and those brave enough to forge new frontiers are confronted with all sorts of procedural difficulties. The following questions are designed to address these difficulties:

Non-Traditional Instruction (The Group B portion)

- Philosophy Statement
 - Should a philosophy statement be adopted district wide?
 - What should be included in the philosophy statement?

- Academic Computer Laboratories
 - What is an Open Entry/Open Exit Lab?
 - What is an Open Lab?
 - What is a Satellite Lab?
 - What is a Closed Lab?
 - What is a Multi-purpose Lab?
 - Other Lab(s)?
- Organizational Structure
 - What organizational structure should be in place for an academic computer lab environment?
 - What role should Administration play in an academic computer lab environment?
 - What role should Faculty play in an academic computer lab environment?
 - Should new Faculty positions be developed?
 - Courseware Author
 - Instructional Coordinator
 - Instructional Facilitator
 - Courseware Designer
 - Consultant
 - Job Descriptions
 - What role should Professional Staff play in an academic computer lab environment?
- Student Records
 - Who should be responsible for student records?
 - Contracts
 - Extensions
 - Withdrawals
 - Adds/Drops
 - Grading
 - Rosters
 - Correspondence
- Courseware
 - How should faculty be compensated for writing instructional courseware?
 - Author to receive payment when project is completed?
 - Author to receive payment for updating course materials?
 - Author to be given paid release time to develop courseware?
 - Author should receive copyright for producing courseware on own time and expense?
 - Author should relinquish all rights to courseware to his/her respective college if college has compensated author?
 - How can quality be ensured for courseware whether produced in-house or purchased commercially?
 - Should a quality-control committee be appointed to evaluate courseware? If so, how many people should sit on such a committee? What area of expertise should these people have?
 - Should courseware be beta tested by a controlled group of students prior to being placed in an academic lab?

Aren't we moving in this direction now? How can these positions be institutionalized?

- Who should be responsible for monitoring the effectiveness of courseware once placed in a lab?

- Faculty Loading

- How should course loading be figured for Faculty who teach in academic laboratories?
- Can there be or should there be a District formula or formulas?
- What formula should be used?
- How can the autonomy of each campus be protected?
- How can Faculty be protected?
- Should there be teachers of record for OE/OE courses or should there be lead faculty who are responsible for all OE/OE courses once placed in an academic lab?
- Should there be a lead faculty person assigned for every shift that an academic lab is available for student use?
- What are the legal ramifications for not having a lead instructional person on duty when an academic lab is in operation?

Excellent questions!

- Grading

- What is the meaning of grades in a competency-based curriculum? For example, letter grades of A, B, C, D, F? grade option of P/Z? grade option of P/F? letter grades of A, B, C, D, F or W?
- What is the grading criteria for each of the grade type options?
- Should all courses have skill evaluations built in for grading?
- Do students have the right to fail?
- What time constraints should be placed on students to complete coursework?
- What procedures should be developed to facilitate "interim" grades?
- What procedures should be developed to facilitate "in progress" grades?
- What procedures should be developed to ensure students that they get the grade option they want?
- What system can be used to track student completers? Success rate of student completers?

- Procedures

- Should there be standardized procedures for records management in an academic lab environment? (See IV. Student Records.)
- Should there be standardized procedures established for users in an academic lab environment?

- Planning Facilities to Support Instructional Computing?

- What are the alternatives to meet facility needs?
- What equipment is needed to support computer facilities?
- What are the staffing requirements?
- What training and technical support should be available?

- What are the maintenance requirements?
- What are the total financial requirements and funding sources.

WHERE DO WE WANT TO GO? (The Group C portion)

The next set of questions were generated from the priorities presented as Group C priorities in the introduction of this paper. This is a set of priorities that will be addressed by this Ocotillo sub committee.

- A statement of philosophy for technology
 - Is a statement needed that reflects the belief of the entire district?
 - What elements will make up the philosophy?
- Reward for innovation
 - Should a reward for innovation be built into our system?
 - What is the nature of a reward for innovation?
 - How shall such reward be administered?
- The changing technical laboratory
 - How do technology laboratories differ from traditional laboratories?
 - Are there varying instructional approaches in using the technology that might require different kinds of laboratories?
 - Are the tools of technology so common that public access be given to all students?
 - If public laboratories are used, do they differ from any other technical laboratory?
- Staff training and development using technology
 - Is there a minimum level of training for all staff members?
 - What specialized training should be made available?
 - Can specialized training and development be used to motivate and assist innovators?
- Innovation communication system
 - Does unnecessary duplication of efforts occur between colleges?
 - How are new findings shared within our district?
 - Do we have a system to bring the best innovative minds together on a continuing basis?

This is a concern that is shared in other group reports.

Part III: Recommendations

Many questions have been raised in Part II of this document. The recommendations given below will relate only to Group B and Group C priorities. If you recall, Group A priorities related to those priorities already being addressed by other Ocotillo Subcommittees. The recommendations will begin by addressing Group B priorities, those priorities which relate mainly to problems arising from trying to use technology in the non-traditional setting that need a broad-base approach leading their solution.

Recommendations from Group B priorities:

A task force should be created consisting of administrators, faculty, and staff members representing each college in the MCCD who are involved in non-traditional academic instruction. The task force should be small enough to work effectively but large enough to involve the people deeply involved with technology and non-traditional instruction.

The Task Force will be responsible for addressing all issues outlined in Part II of this report by collecting data from all possible resources and preparing a document outlining the recommended solutions to the problems. This same task force will be charged with the responsibility to expedite the recommended solutions by working with the appropriate entities in or out of the district to effect the necessary changes. Times lines are given below:

- Collect data
- Fall Semester of 1989
- Finished Document
- Not later than March 31, 1990
- Expedite the Solutions
- To be determined

Recommendations from Group C Priorities:

The solution to Group C Priorities have been addressed by this subcommittee with the recommendations given just below. This subcommittee wants the Ocotillo group to review the recommendations, alter them as necessary, and recommend them to the proper authorities for immediate implementation.

The recommendations follow the same pattern as the questions given in Part II of this report. The areas of questions were:

- Establish a philosophical basis for technology
- Encourage and nourish innovators
- Define the variety of technical laboratories
- Staff training and development
- Database of information about innovative projects

(R)

Statement of Philosophy

This statement of philosophy is a reflection of the current collective thinking of the technology area of MCCD. It entails the affirmation and acceptance of the responsibilities that technology has to provide not only to the students it serves but also the community to which it is responsive. Among these responsibilities are the assurance of state-of-the-art equipment and programs, the selection of the best prepared personnel, and a safe, clean, comfortable, effective learning environment.

Further, this philosophy recognizes the vital role that technology plays in our modern society. Technology is never static, but always dynamic. It aims to prepare both the student and the community to cope with the emerging advances in technology.

It is appropriate, therefore, that the highest levels of administration should support and finance the goals of technology.

Because the various campuses differ greatly in demographics, each campus should be afforded a wide latitude of autonomy and specializations of curricula. But each campus must be committed to the following objectives:

1. Encourage interdisciplinary sharing of facilities, hardware, and software.
2. Encourage nondepartmental ownership of technological facilities, hardware, and software.
3. Make technology continuously available for students faculty, and staff, with maximum access to technology facilities.
4. Provide quality instructional facilitators, facilities, and instructional materials for new and emerging technologies.
5. Promote a variety of teaching methodologies to teach technology.
6. Provide quality instruction at reasonable tuition and lab fee rates.
7. Encourage and support faculty and staff to constantly strive to be on the leading edge of technology.

Finally, it is the role of technology to encourage all individuals from all backgrounds and of all ages to develop their skills and talents to the best of their abilities.

It is our recommendation that Ocotillo review the above statement and to alter, add, or change as agreeable to the all. Further, we recommend that the Statement of Philosophy be approved by Ocotillo, the MCCD Governing Board, and the Administration so that it may serve as a general guideline all.

Isn't the real power of technology unleashed when it is the medium and not the message?



Encourage and Nourish Innovators

Realizing that innovators are the catalysts to the highest and best use of technology, we therefore recommend the following:

In an effort to support innovation and show good faith to our innovators, we are recommending a process of awarding research and project dollars. Such dollars are to be awarded for the continuation of the innovative work of these persons.

It is recommended that a stipend be given to each campus innovator to support projects of their choosing. This stipend to be issued in the school year following the selection of the innovators.

It is further recommended that the person who is named district innovator be awarded an additional stipend to complete a project of his/her choice.

Definition of Technical Laboratories

In order to develop more clarity regarding laboratories and their use, we recommend that Ocotillo provide a definition of the various technical laboratories to be used as a guideline in the building and development across our district. As a beginning point, we submit the following statements for alteration and acceptance by the Ocotillo group.

Public Computer Lab. Public computer laboratories should be positioned in the most accessible public facilities on campuses; e.g., libraries, learning centers, student unions, etc. A partnership should exist between the public computer lab and computer services. Technology support would come from computer services with management assistance being provided by the partner.

This lab would consist of a variety of microcomputer equipment reserved for use by all students who need to use the facility to support their academic needs. No credit will be connected with this lab. Student use and administration will be strictly determined on a lab fee basis. Certain basic software would be provided by the institution with students being permitted to use their own software.

Open Labs. Open labs are labs made up of a great variety of equipment. The only student users would be students assigned because of specific coursework assignments.

This lab would never be scheduled and would feature maximum access and interdisciplinary use. It would serve three major components: OE/OE, lab for lecture classes, and classes from any department classified as occasional users for computerized assignments.

This focused on individuals as innovators. Are not the best innovations a result of collaborative efforts?

(R)

(R)

(R)

(R)

Isn't one of the important distinctions between these labs the nature and quality of assistance provided to students? Who manages these labs? Who pays the operational costs?

Departmental Lab. Basically a closed lab class scheduled as a classroom controlled by an academic department and/or an organizational unit.

Staff Training and Development

While innovation serves as a catalyst for development, we recognize that faculty and staff training and development in the technology is essential for broad-based use. We recommend that Ocotillo search out and find new ways for this development to occur. Further, that specific recommendations be made by Ocotillo for acceptance by the Administration and Board of MCCD.

(R)

This subcommittee provides the following ideas as the beginning point for discussion:

Faculty training should be encouraged by continuing sabbatical leaves, providing paid leaves of absences for assigned special academic projects, providing District research dollars for innovative projects, and promoting faculty to attend District, University, and business community training programs.

(R)

It is further recommended that the Software Library (Innovation Center) become a powerful technical support system to train staff and faculty on an individual basis.

(R)

Database of Innovative Projects

It is recommended that an interactive means of communication be made available to communicate new, on-going, and completed District-wide projects.

A computer-based information system should be developed to track and list technological projects that are in progress and completed. An abstract would be required and available for all completed projects. All projects should be cross-referenced in a variety of ways: originating campus, name of author, equipment, software, course, program, etc.

(R)

Comments from the Chairs

by Alan Jacobs, SCC
Jim Walters, District

Observations

by Jim Walters, District

Hierarchy of needs

I left Montezuma Lodge and Technology Retreat '88 on a real high. I felt excitement in the group—a unity which would provide momentum for the further explorations of the topics which came out of the retreat. My excitement continued over the summer as Alan and I planned and worked with Alfredo to structure Ocotillo.

With fall and the beginning of school came the initial meetings of the Ocotillo groups. I observed a sudden slowing of the momentum generated by the retreat. This phenomenon manifested itself in the ways that people participated in Ocotillo. Many people who had been key contributors at the retreat had difficulty in finding time for Ocotillo meetings or were unable to participate. Ocotillo groups, with a couple of exceptions, lacked continuity of participants. Of the people who participated, many attended a meeting or two, but did not persist in the group throughout the year.

As my thoughts about this have coalesced, I perceive the problem in terms of an organizational hierarchy of needs that is somewhat similar to Maslow's hierarchy of human needs. Following is an attempt to place some of our organizational needs into a hierarchical format. Although the exact placement of different MCCCCD needs may be disputed, it appears that in a situation where a faculty member has to choose between preparing an exam or planning a 10 year technology agenda, the instructional activity will take priority in a vast majority of cases.

Maslow's Human Needs

1. Physiological needs – food, water, sleep, etc.
2. Safety needs – physical and psychological safety and security
3. Social Needs – attention, belonging and acceptance
4. Ego Needs – respect, recognition, and achievement
5. Self-actualization

MCCCCD's Needs

1. Students, FTSE, personnel, preparing for class, grading tests
2. Budget, catalogs, schedules of classes, accreditation, policy manuals, preparing/revising handouts
3. Advisory committees, user groups, task forces, revising course notes
4. National reputation, involvement with universities, new course/program development
5. Synergy, unity of purpose, a sense of shared vision, long range planning

Comments

To survive as an institution, we must have students and must offer educational opportunities for those students. With this basic requirement comes a wide variety of duties related to staffing, reporting, recruiting, ordering, etc. These are the organizational equivalents to the human physiological needs of food, water, and sleep. Without students in classes, we cease to exist as an organization. Similarly, to reach our full potential as an organization, our organizational self-actualization, we need to spend the time in reflection, analysis, planning, and improving.

Technology Retreat '88 took place in an environment away from the classroom - away from the students. With the other levels of organizational need not requiring attention, we were free to focus on the future. We probed who we are as an organization and looked at where we want to be and even talked about how we get from where we are to where we want to be. In this environment, Ocotillo was conceived.

Ocotillo was given organizational birth in quite a different setting. Ocotillo appeared in our early fall (who works registration? will my class make? who is teaching this section? where can that section meet? where are my textbooks?) organizational environment. It is difficult to catch ones breath at a college that time of year, much less devote time to and concentrate on a long term vision in the midst of such pressing organizational needs.

My initial thinking about the phenomenon that I am describing was that the momentum of maintenance was steamrolling over and crushing our efforts to look forward and to plan for the future. Now, I see that we really don't have two forces that are opposing, we just have a strong sense of organizational survival. This survival instinct will enable us to be around to implement the plans that we develop. As an organization, we do what is necessary to survive, and it seems that the same instinct also compels us to plan and look forward.

Against this backdrop, I am pleased with the accomplishments of the Ocotillo groups. People have given of their time to begin building a vision of improving learning through technology. I applaud the people who have given of their time to voluntarily work with one or more of the Ocotillo groups. This time has been given above the book orders, the test grading and all the other basic organizational needs that occupy much of our time.

Based on this experience, I believe that we should make some changes in Ocotillo for next year. My initial recommendations include:

1. Make participation in Ocotillo and other planning efforts a formal committee assignment with the weight, status and

time considerations of other district-wide committees.

2. Provide more opportunities away from the workplace for planning and discussing issues related to our organizational future.

I am sure that over the course of the retreat, other recommendations will emerge and that the ones listed above will be modified. This ability to refine and expand ideas as a group is a true strength of the organization and one that we rely on heavily in trying to move forward.

Communications: The CoSy Experiment

Last fall, when Ocotillo began, a bulletin board system titled CoSy was set up for use by Ocotillo groups. The decision to try to use an electronic system was based on the assumption that more people could contribute if they could participate in asynchronous discussions from their office. With CoSy, people could read what everyone had contributed and have the opportunity to respond to specific topics or contribute new thoughts. This has been documented as a successful way to carry on discussions that are topic specific in numerous locations around the world.

Use of CoSy never gained enough momentum to be successful with the Ocotillo groups. Despite having an above average inclination toward technology use, of the 130 plus persons who received passwords to use CoSy, only about 10 became active participants. Because of the need to communicate information to group participants who were not looking at CoSy on a regular basis, groups quickly switched to electronic mail for their communications needs.

Based on comments that I heard and conversations that I have had, several issues enter into the lack of success of CoSy as a communication medium. CoSy was software that was unfamiliar to many users. It is command line driven, that is a user had to type in a command to tell CoSy what to do. This is different than the menu based systems like All-in-1. Additionally, CoSy represented a communication style that is different than we are accustomed to. We in the district who communicate electronically tend to depend solely on electronic mail. The idea of running a different software package to get messages is not a part of our routine. Moreover, with A1, one is alerted that messages are waiting to be read when you log into the VAX. There is no provision for this in CoSy and you can't tell if there are things that you haven't read until you get into CoSy. Another key issue is that we tend to limit readership of our elec-

tronic messages. With CoSy, everything that one enters is open to everyone who has access to the conference. There were also some glitches in the CoSy software. For example, the default editor lacked word wrap which is viewed as a necessity for those who have forgotten how to hit "return" at the end of each line. But the key issue that caused CoSy to be unsuccessful appears to be one of electronic communications overload.

Maricopa employees rely heavily on three modes of asynchronous communication. They check their mail box or in basket for paper messages, check A1 for electronic messages, and check voice mail for verbal messages. Except for the mass mailings, and the @ All Users, these messages are directed to the receiver and are considered to be important. (Isn't it nice that no one has started using voice mail for mass distribution yet?) If there are messages sent in other ways, we are not accustomed to receiving them. Besides, we really do not have the time to frequently access yet another system to check for messages. As another separate system, CoSy was ignored.

In looking at the communications needs and at the systems that are currently available, I would suggest that A1 be expanded to handle other communications needs. The current time management system could be a place where all meetings, events, and activities could be both built into a schedule and advertised. If an event could be placed on the calendar with the user choosing to read or ignore the information related to the event, it would take some load from electronic mail and save users from reading about things they are not interested in as a prerequisite for deleting the item. The calendar system should have a flag to inform the user that a new event had been posted. This could then serve as a master calendar for the district and would list district activities and deadlines as well as activities of the colleges and charitable events. Another A1 menu choice could lead to a conferencing system. In this system, people could join public conferences and participate in discussions related to a topic. There would also be provisions for conferences restricted to a certain group. For example, a committee could use a private conference to exchange information and ideas. Again, there would be a message to let the user know that new messages had been posted in a conference to which the person belonged. By expanding the current system to handle these needs, our communications would be enhanced and people would be less inclined to send electronic messages to everyone.

CoSy did not assist in facilitating the communications among Ocotillo participants, but the attempt to use it has provided us with opportunities for further analysis and discussion.

An opinion

by Alan Jacobs, SCC

Who owns computing?

Imagine yourself strolling through campus buildings in 15 or 20 years. As you see students using computers* you ask each one, "For which department are you doing an assignment?" How will the results of your survey tally? Will 90% of the students say, "We're learning to use XYZ software from the CIS department"? Or will 90% give the name of some other (not CIS) department?

I believe that it could happen either way. I also believe that we can choose right now which direction we want to take. I am motivated to raise the issue at all because I am concerned about the relatively slow rate at which technology use is being brought into instruction. The purpose of this brief *editorial* is to raise the issue of who 'owns' computing in as direct a way as possible.

In the present year, the answer to the above survey of student computer users is likely 90% CIS and 10% other. This current dominance of CIS has an historical basis.

In the '60s and '70s and early '80s, the Data Processing curriculum was in high demand. DP departments taught courses in the major programming languages of the day, especially COBOL, with additional courses in BASIC, FORTRAN, Pascal, Assembler, etc. During the latter half of the 1980s the college DP departments experienced a marked decline in enrollment in the traditional programming curriculum. At the same time the college started to see the increased need to teach computer application programs like spreadsheets, word processing, and databases.

In the middle 1980s, the DP departments re-formed themselves to CIS (Computer Information Systems) and leaped to develop courses to teach the myriad of applications that people wanted to learn. The CIS departments acted quickly to address the major changes that were taking place in computing. CIS moved the curriculum from 'strictly mainframe' to 'mostly micros' and moved the curriculum from strictly programming languages to mostly applications in the space of only a few years. In the context of the time, it made sense for CIS to meet the increasing demand for teaching computer applications. After all, CIS

* Of course, students may all have their own computers in 15-20 years. There may be very few on campus. If you believe this, imagine that you are strolling through the neighborhoods, asking community college students the same question. In other words, no matter whose computer they're using, for which department is the assignment being done?

Comments

faculty were 'good at' computing and knowledgeable in varieties of software. They had, no doubt, a more favorable learning curve than many other faculty, when it came to learning to teach new computer application programs.

Major changes in computing were also happening in MCCCC instruction in this same time frame. During the middle 80s, the district made a commitment not only to improve faculty computer literacy in a big way (through the Faculty Computer Literacy Project and other on-going endeavors), but also to put more computing power into the hands of faculty and students (by way of the 10 year bond funding). As a result, most MCCCC faculty are computer literate and use the computer systems in their offices for office-type purposes, mostly word processing.

I believe the time has come to re-evaluate the appropriateness of relying on CIS to teach major computer applications.

I am very impressed, for example, when I look at the products that students produce in their computer art courses. Under the guidance of an art instructor, the students do art on the computer, at the same time learning the use of the software. Now, I believe that I could teach anyone how to use a Paint or Draw program on a computer. That is I could teach booting the program, the software commands for drawing lines and curves and filling areas, etc. But I could in no way teach art. So I am extremely impressed by the quality of the work that the art instructors are able to get from students in their computer art classes. And as a result I know that they are the most appropriate teachers of this software.

I am also very impressed by the quality of work that the drafting instructors are able to get from their students in Computer Aided Design courses.

I'm pretty sure that someone with a publications background, or a design background, would be able to get much better results from students in a DeskTop Publishing course than would someone who is mostly interested in teaching the software commands. For this reason I believe that CIS should not be in the business of teaching DeskTop Publishing (DTP) software. The objection might be raised on CIS's behalf that 'those other instructors aren't really interested in teaching software, are they? Wouldn't they rather spend their time on design?' To the extent this objection is valid, I believe it only speaks to teaching DTP as a team effort, as is currently being done at GWCC. Actually, I believe the objection is actually harmful in that it literally robs the 'other instructors' of the responsibility of learning (and then teaching) the current tools of the field.

Even though spreadsheets have been available since the early '80s very few math courses use them at all. There are several appropriate places where spreadsheets could be useful for mathematics, especially those with graphing capability. Why hasn't spreadsheet use come into math courses? Among other reasons, I believe that it's because the math departments have been able to evade responsibility for teaching these mathematical tools. CIS teaches those courses; it's their job, not ours.

I honestly believe that if math departments taught spreadsheets, then spreadsheets would be used in nearly every math class. And I believe the same would apply to economics, chemistry, sociology, etc. If those instructors taught spreadsheets, for example, they'd infuse usage into their 'own' courses.

Well, what is the difference between computer art and word processing? I believe that there is no difference. I believe that the people who teach writing (in an age of writing across the curriculum, that may be lots of us) ought to teach word processing. In the first place, the command language for at least one word processing program is something nearly all faculty are familiar with because they use it daily. So I believe that most of us could also learn to teach any of the word processing programs that are in the curriculum. In the second place when we take the responsibility for teaching the computer software that our students will use, we become even more computer-aware and we will infuse our subject matter with even more appropriate computer use.

Let's not wait until some genius comes along in 20 years with the innovative idea of computing across the curriculum. Let's take the opportunity right now to spread responsibility for teaching computing to all departments across the curriculum. We all need to assume ownership of computing.